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**PRESIDENTIAL ADDRESS AT THE LARYNGOLOGICAL
SECTION OF THE ROYAL SOCIETY OF MEDICINE.¹**

BY MARK HOVELL, F.R.C.S.E.

President of the Section.

As all the Fellows of this Section are teachers, it is their views and methods which, in a great measure, mould the opinion and lines of practice of the younger members of the profession who are learning this branch of their work, and therefore, as a Section, a considerable amount of responsibility rests on its members.

Many of the diseases dealt with in this Section are not local in their origin, and it was mainly due to this fact that Sir Morell Mackenzie had to encounter an immense amount of opposition when laying its foundations. I well remember Sir Richard Quain, who, by the way, was a very shrewd and capable practitioner, ridiculing the idea of diseases of the throat being regarded as a specialty, for he argued that most of them had their origin below the diaphragm, and, of course, there are ample grounds for this statement.

We all know that the commonest cause of functional aphonia in women at or past middle life, and in some cases of young women, is due to displacement of the uterus, or some other affection of that organ, displacement of the uterus being by no means uncommon in unmarried girls, and likely to become still more frequently met with now that they ride astride.

¹ Read November 3rd, 1916.

Granular pharyngitis also is not the result of improper voice production, but of derangement in either the gastro-intestinal or utero-vaginal tract, or both of them combined, so that dyspepsia, constipation, or bowel derangement producing looseness, etc., displacement of the uterus, or other uterine affections and leucorrhœa, all require to be seriously treated if the throat affection is to be cured.

Then, again, the connection between nasal irritation and bowel irritation is known to almost every old woman, and if she sees a child picking his nose she says without the slightest hesitation, "that child has worms," and her diagnosis is very often correct. As specialists we know that the cases of nasal obstruction due merely to hypertrophy of the soft tissues which are not relieved by cauterisation, in many instances are the result of gastro-intestinal irritation which has been overlooked or insufficiently treated, and it is felt in many cases when this region has been thoroughly dealt with that if this had been done in the first instance cauterisation might have been unnecessary.

Although the facts alluded to by Sir Richard Quain are known to all of us and acted upon, yet the great progress which has been made in the treatment of throat affections could not have taken place if the specialty had not been created.

The greatest advance has been made in surgical procedure, especially with regard to laryngo-fissure, the sub-mucous resection of the nasal septum, and operations in connection with the sinuses contiguous to the nose.

Then, again, the improvement in electrical apparatus has enabled foreign bodies to be removed from the œsophagus and air-passages with the aid of direct vision, from a situation which was previously inaccessible without exposing the patient to grave risk.

With regard to the direct method, I cannot help feeling that it would be greatly to the advantage of the younger members who practise in our branch if they were to train themselves also to the indirect method, which is most useful for the removal of papillomata and the treatment of nodules on the vocal cords, as well as other laryngeal conditions. It is quite easy, and merely requires the hand to work in accord with the object in the mirror, and with practice the action becomes automatic, the fact that the image is reversed being entirely disregarded.

It is to be regretted that general surgeons do not more quickly adopt the improved methods of procedure introduced by specialists.

I have in mind at the moment local anæsthesia to assist the operation of tracheotomy as opposed to general anæsthesia. It is more than forty years ago since Sir Morell Mackenzie introduced local anæsthesia for this operation, the result being obtained by freezing the skin with a preparation known as "anæsthetic-ether," which was prepared by a firm of chemists named Robbins in Oxford Street. When the skin has been frozen the trachea can be easily reached with but little discomfort to the patient, who is best seated in an arm-chair. The youngest patient that I remember to have operated on by this method was a boy of fourteen years of age.

Now that local anæsthesia can be produced by sub-cutaneous injection of drugs it is to be hoped that this method will become universally adopted, for its advantages are obvious.

Before leaving the subject of tracheotomy I should like to refer to another detail introduced by Sir Morell Mackenzie which greatly adds to the comfort of the patient. It is inserting a piece of $\frac{1}{2}$ in. elastic about 3 in. long into the tape on each side which holds the tube in position, the tape being attached to the tube by means of the snap hooks such as ladies use for fastening their dresses, and being fastened behind by either tying or having a hole in one tape to which a hook on the other is inserted; but I still see tape only used systematically by general surgeons, which is no improvement in the method of a century ago.

I am one of those who feel that patients with malignant disease ought not to be allowed to suffer unnecessary pain, and therefore mention the treatment in a case of cancer by a physician who died a few years ago. He began to relieve her pain with the ordinary doses of morphia, but as she became tolerant to the drug, and the extension of the disease made the pain more severe, he gradually increased the dose until the daily dose given amounted to between 30 and 40 grains, and on days when the pain was more than usually severe the doses given amounted to between 40 and 50 grains. He told me that the patient used to wake, take her food, chat and be quite comfortable until the return of the pain made another dose of morphia necessary, when she again relapsed into sleep, and thus she was kept to the end comparatively free from pain and in as comfortable a condition as it was possible to make her whilst suffering from what would otherwise have been a most painful as well as a mortal disease.

The physician to whom I have alluded, as is evident, did not trammel his actions with the posological table of the Pharmacopœia

but based his methods on common sense, which is the rock bottom of successful medical treatment.

Although curative measures cannot always be disassociated from pain, every care should, I think, be taken to produce as little as possible. At the present time almost every practitioner considers himself competent to operate for adenoid growths, and from what I am told there appears to be far more pain than is necessary following this operation. The cause is obvious; the operation is begun before the patient is sufficiently anæsthetised, and the soft palate as a consequence thoroughly relaxed, and therefore it becomes torn, and thus the subsequent pain is produced. If the operator were to wait perhaps only another minute, the soft palate would become completely flaccid and could be lifted out of the way. A skilled anæsthetist has no difficulty in maintaining the soft palate in this condition throughout the operation and yet allowing the reflexes of coughing and swallowing to be retained.

When the tonsils are removed there is, of course, slight pain on swallowing for a day or so, but this can be practically removed by the method which I introduced many years ago, of placing the palm of a hand over each ear with the fingers pointing upwards, and then making very firm pressure whilst the patient swallows, the greater the pressure the greater being the relief to the pain. This simple method applies to all cases of odynphagia, no matter what the cause.

I gather that the removal of the posterior extremity of each inferior turbinated body when enlarged is still not universally regarded as an essential part of the operation for the removal of adenoid growths, but I take this opportunity to again repeat as a result of extended experience that since I performed this very simple addition to the operation for the removal of adenoid growths I have not had cases of recurrence.

I must repeat that no harm can result from passing a snare through the nostril, even should it not encircle hypertrophied tissue, and that whether or not the ends are enlarged sufficiently for removal cannot be ascertained by touching them with a finger. I still hear that it is thought that the procedure is difficult, but, on the contrary, it is extremely simple if the point of the loop is steadied against the side of the choana with the left fore-finger, and the snare is held lightly in the right hand and run forward as the loop is contracted.

We all know that it is not only the duty but the privilege of members of our profession to relieve pain, and as all of us are

treating almost daily cases of granular pharyngitis, we are therefore aware of the frequency with which girls and unmarried women suffer pain at their periods, as it is a condition which is so frequently associated with this affection, although it is common amongst other individuals who do not exhibit throat symptoms. From the frequency of its occurrence it is evident that throughout the profession there is at the present time a large amount of indifference to this periodical suffering, which we all know is at times severe, as otherwise patients would not be suffering in this way when they come to us for throat treatment; and I feel, therefore, that we as a section, having to deal so largely with these cases, may not only teach but continue to set the example of relieving this suffering, which in the large majority of cases is so simple a matter that it entails writing only one prescription. Drachm doses of liquor *caulophylli et pulsatillæ* taken every two hours as soon as the pain at the period commences, or three times a day if there are twinges of pain before the period comes on, not only relieve the pain in the course of a few hours, but if the remedy is repeated with each succeeding period in many cases the pain becomes a thing of the past, and remains entirely absent for years. If liquor *caulophylli et pulsatillæ* is combined with spirits of chloroform, compound tincture of cardamoms and glycerine, the mixture is not disagreeable. The neuralgic cases are, of course, much more difficult to treat, but fortunately they are in the minority; but most of them only require a little thought as to the selection of the remedies which are tabulated in most pharmacopœias, and a proper adjustment of the dose, to enable the relief which is sought to be obtained.

There may be gynæcologists and others who will say that treatment of this ailment belongs to their department, and does not concern us as throat specialists, but to these I would point out that it is the duty of every medical man to relieve pain, and it would not be necessary for us to so treat these patients if they had not been neglected, as otherwise the pain would not exist, or they would be in possession of the remedy. I should also remind them that it was the priest and the Levite who professed philanthropy and goodness, but yet, nevertheless, when they saw the man lying wounded and half dead by the roadside, passed on the other side, and that it was the Samaritan who did not profess to be better than his neighbours, who relieved the man's suffering and took care of him.

Although surgery must claim the greatest improvement in the

methods of treatment of the affections dealt with by our specialty, yet from time to time medicinal measures are discovered which are of great service, and as I consider it is the duty of all to make them known, I propose to mention a few remedies which I am inclined to think are not as generally known as they might be with advantage.

Some cases of loss of smell and taste and of paroxysmal sneezing are relieved by tincture of aconite, which for this purpose may be given only three times a day. It is not an infallible remedy, but useful to remember. For the relief of the effects of coryza, oil of peppermint volatilised by heat and the fumes inhaled is recommended by Martindale in his "Extra Pharmacopœia" in preference to menthol, a free airway being frequently obtained after a few sniffs. Used in this manner it frequently cuts short a nasal catarrh and allows patients to obtain sleep who have previously been kept awake by the blocked condition of the nostrils. It also removes headache when due to a congestive condition of the lining membrane of the frontal sinuses. The simplest way to use it is to place two or three drops in a spoon and then warm it. This amount will do for several times.

The cases of tickling cough which not only are very common after influenza, but which may follow a simple cold or occur without known cause, are frequently due to enlargement of the lingual tonsil, the cough apparently being produced by the swollen tissue coming into contact with the epiglottis. A solution of chloride of zinc, 15 to 30 grains to the ounce, with a trace of dilute hydrochloric acid to thoroughly dissolve the salt, is in many cases sufficient to remove the trouble, but I am indebted to Mr. Morley Agar for calling my attention to the best remedy for this condition, namely, trichloroacetic acid. A very small quantity of this drug only is required, and it is best applied on a wool-holder bent at a right angle, with only a very thin layer of wool attached to it so as to ensure the quantity of acid being small. It is best applied with the aid of a mirror, so that it can be accurately placed on the swollen tissue.

Enlargement of the lingual tonsil as a source of throat irritation, as far as I am aware, is not universally recognised, for if this were so the cases of paroxysmal cough which are so frequently met with would not be allowed to continue as they do.

I have recently come across a case which I think is pathetic, considering the ease with which a cure has been effected. For fifteen years a lady, aged fifty-eight, has been subject to violent

paroxysms of coughing both by day and by night, an attempt to enter into a conversation or certain positions whilst lying down immediately starting the cough, and as a consequence life had become a burden to her. The cough has now almost ceased. When I first saw her the lingual tonsil was considerably enlarged, and from previous experience I felt sure that this was the seat of the trouble. The cough began to lessen after the first application of trichloracetic acid, and as the swelling contracted the greater was the relief obtained, until now the cough is only occasional.

Still more recently I have had a similar case where the cough has lasted for seven years. In this case also the cough diminished as the swelling of the lingual tonsil decreased.

A few months ago, at the repeated request of many friends to whom I had suggested the treatment and who had found it very effective, I sent a short letter to the medical press calling attention to the beneficial effects of garlic in whooping-cough. The remedy, as you know, is by no means new, it being known to most old women and herbalists. Immediately I had done so I heard of an outbreak at a school, and I at once communicated with the medical officer suggesting the use of garlic. The opinion of all the masters and both matrons is that it had an immediate beneficial effect in many cases, but on some it appeared to have no effect. The garlic was administered by peeling the segments of the root, called cloves, cutting them in thin slices, and wearing them beneath the sole of the feet between two pairs of socks, for if worn next the skin the irritation of the juice results in sore feet. One of the masters mentioned that a boy who used to cough, previous to the administration of garlic, until he was, as he termed it, black in the face, after using garlic for two days no longer experienced extreme discomfort.

I have recently seen two patients who had suffered from whooping-cough in whom the cough persisted, and in each case I found that the lingual tonsil was considerably enlarged. Knowing the manner in which this condition produces violent fits of coughing, it occurs to me that this may be the cause of the paroxysms in whooping-cough. As in the case of paroxysmal cough which I have just referred to, the cough in the whooping cough patients diminished as the swelling of the lingual tonsil subsided under the application of trichloracetic acid.

If, therefore, I am right in my conjecture that the violent paroxysms of coughing are the result of enlargement of the lingual tonsil, the terrors of whooping-cough have ceased to exist,

for I think without doubt the juice of garlic passed into the circulation in the raw condition through the skin destroys the micro-organism of whooping-cough, and if a strong astringent is applied to the swollen lingual tonsil, the source of irritation which produces the cough will be removed. It is probable that any strong astringent would produce the desired effect, and therefore tannic acid, nitrate of silver, iron, zinc, or any other astringent might prove sufficient, but in all cases, of course, care must be taken to prevent the application from trickling into the larynx, a spasm, however, being quickly dispelled if the patient can be induced to speak, "London" being a word which usually answers the purpose.

I am not in a position to see many patients who are recovering from whooping-cough, but I hope that those who do so will carefully examine the condition of the lingual tonsil, and if it is found enlarged record their experience of the application of astringents to the swollen tissue.

I must not detain you longer, because there are many cases under discussion, but I hope that every member of this Section will record from time to time his experience of remedies which assist in the alleviation of suffering.

REPORTS FOR THE YEAR 1915 FROM THE EAR AND THROAT DEPARTMENT OF THE ROYAL INFIRMARY, EDINBURGH.

Under the charge of A. LOGAN TURNER, M.D., F.R.C.S.E., F.R.S.E.,

PART V.

THE PATHOLOGY OF CONGENITAL SYPHILITIC DISEASE OF THE EAR.¹

By J. S. FRASER,

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AND

RICHARD MUIR,

Member of the Pathological Society of Great Britain; Demonstrator of
Pathological Methods, University of Edinburgh.

INTRODUCTION.

CONGENITAL syphilis ranks after cerebrospinal meningitis and middle-ear suppuration as the most frequent cause of "acquired" deaf-mutism. There is reason also to believe that many cases of

¹ The work was carried out in the Research Laboratory of the Royal College of Physicians and in the Pathology Department of the University of Edinburgh.

so-called "congenital" deaf-mutism are really due to intra-uterine syphilis or to syphilitic changes in the ear occurring before the child has learned to talk. Alexander states that the most severe forms of ear syphilis occur in intra-uterine life. The newly born infants show all the signs of congenital deafness and the static labyrinth is not excitable. Statistics as to the frequency of deafness in children suffering from congenital syphilis vary very

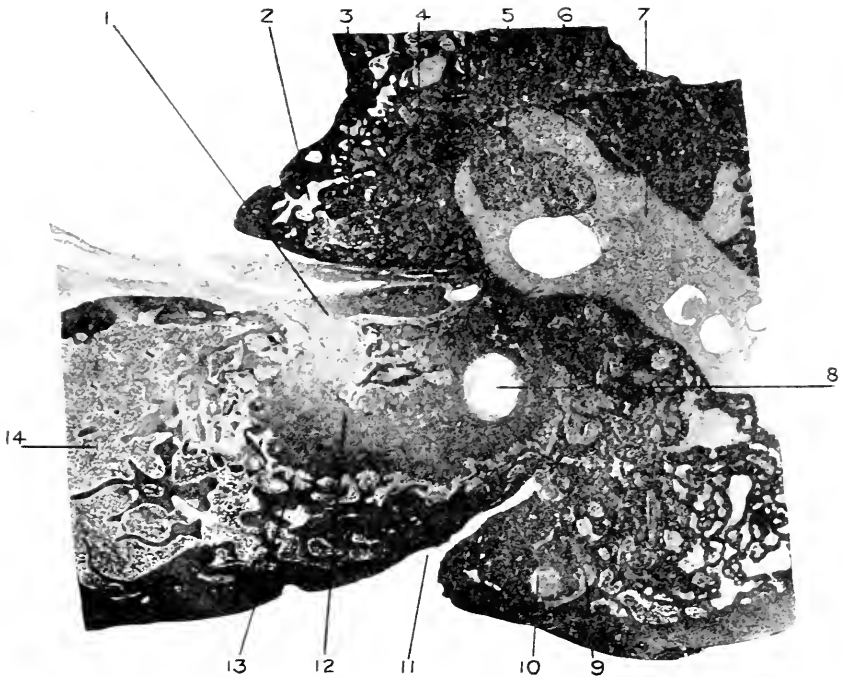


FIG. 1.—Congenital syphilitic disease of the ear. Horizontal section through left ear (No. 102). $\times 5$ diam. 1, Geniculate bend of facial nerve. 2, Normal fatty marrow. 3, Normal cellular marrow. 4, Osteoclastic marrow. 5, Head of malleus ankylosed to attic wall: note erosions. 6, Body of incus: both ossicles show wide marrow spaces. 7, Greatly thickened submucosa of attic. 8, Ampullary end of superior canal. 9, Osteoclastic marrow eroding bony wall of canal. 10, Smooth end of superior canal filled with granulation tissue. 11, Opening of fossa subarcuata. 12, Upper part of bony cochlear capsule. 13, Osteoclastic marrow eroding cochlear capsule. 14, Normal cellular marrow in anterior part of petrous pyramid.

greatly. Some authorities put it as high as 60 per cent., others at only 33 per cent. In twenty-one syphilitic families Kerr Love found that there had been altogether 172 pregnancies, of which 30 resulted in miscarriages or still-births. Of the 142 children born alive, 45 had died, thus, with the miscarriages and still-births, giving a total of 75 deaths. (Among the 45 deaths which occurred

after birth there were many cases of meningitis). Of the 97 individuals living at the time of examination 31 were deaf and blind. Of the 66 living children who were neither deaf nor blind, many had been born before the parents contracted syphilis. Yearsley found that 3.5 per cent. of children in the London County Council deaf-mute schools were suffering from congenital syphilis.

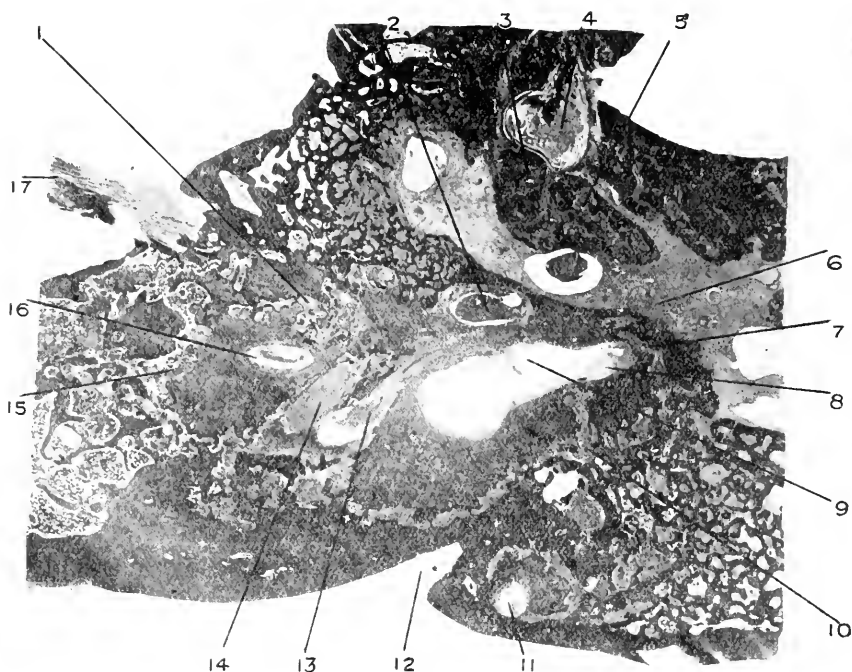


FIG. 2.—Congenital syphilitic disease of the ear. Horizontal section through left ear (No. 150). $\times 5$ diam. 1, Osteoclastic marrow around cochlear capsule. 2, Facial nerve. 3, Head of malleus. 4, External meatus with desquamated epithelium and necrosed bone. 5, Body of incus with enlarged marrow spaces. 6, Thickened submucosa of aditus. 7, Osteoclastic marrow eroding bony wall of external (horizontal) canal. 8, Perilymph space of external canal filled with granulation tissue. 9, Ampullary end of external canal with crista and cupula. 10, Osteoclastic marrow eroding wall of canal. 11, Smooth end of superior canal partly filled by granulation tissue. 12, Opening of fossa subarcuata. 13, Vestibular nerve. 14, Facial nerve. 15, Erosion of cochlea capsule by abnormal marrow. 16, Basal coil of cochlea. 17, Great superficial petrosal nerve.

Siebenmann, of Basle, gives a percentage of 5.6, and Beck of 8.1 as representing the cases of congenital syphilitic deafness among deaf-mutes. E. Urbantschitsch has examined the Wassermann reaction in 125 deaf-mutes and found it positive in 33. Kerr Love had the Wassermann reaction tested in 157 cases, mainly collected from the Deaf and Dumb Institutions of Glasgow, and obtained a

positive reaction in 48 and a doubtful reaction in 8. Kerr Love maintains that the late type of congenital syphilitic deafness is usually an evidence of expiring syphilis. He holds that the Wassermann reaction does not discover all the cases of congenital deafness which are due to congenital syphilis because, when no active process, apart from the deafness, is going on, the Wassermann test sometimes gives a negative result. When syphilis has

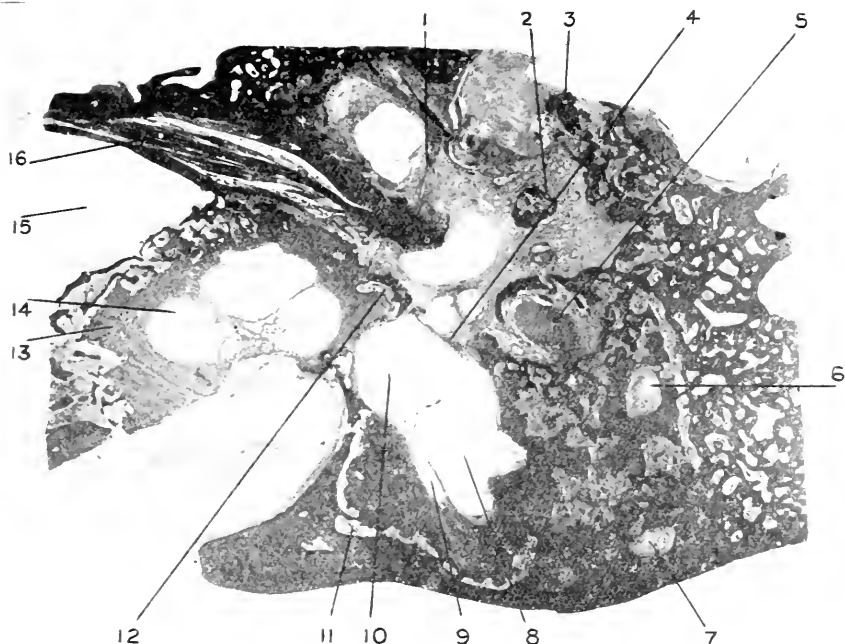


FIG. 3.—Congenital syphilitic disease of the ear. Horizontal section through left ear (No 282). $\times 5$ diam. 1. Tendon of tensor tympani. 2. Long process of incus. 3. Necrosed bone being extruded into external meatus. 4. Footplate of stapes. 5. Facial nerve. 6. External canal: the perilymph space is filled with granulation tissue. 7. Posterior canal: also filled with granulation tissue. 8. Utricle. 9. Ductus endolymphaticus. 10. Dilated saccule. 11. Osteoclastic marrow which, higher up, erodes the internal meatus. 12. Osteoclastic marrow in bone of promontory in anterior margin of oval window. 13. Bony capsule of cochlea. 14. Dilated scala media of basal coil of cochlea. 15. Carotid canal. 16. Tensor tympani muscle. Note the erosion of the bony capsule of the cochlea by the osteoclastic marrow.

become latent the reaction is negative in fully 50 per cent. of cases. By the time a congenitally deaf child has reached school age the syphilitic poison has "burned itself out," so that a positive reaction cannot be obtained. In other words, some cases of congenital deafness are syphilitic, although the blood reaction is negative. O. Mauthner (*"Monats. f. Ohrenheilk."* 1915, p. 673) makes the

remarkable statement that in 1 per cent. of all men unfit for military service (active or auxiliary) syphilitic affections of the ear are the cause of the disability. As recruits are called up for examination at the age of eighteen years the syphilitic affection must be congenital in almost all cases.

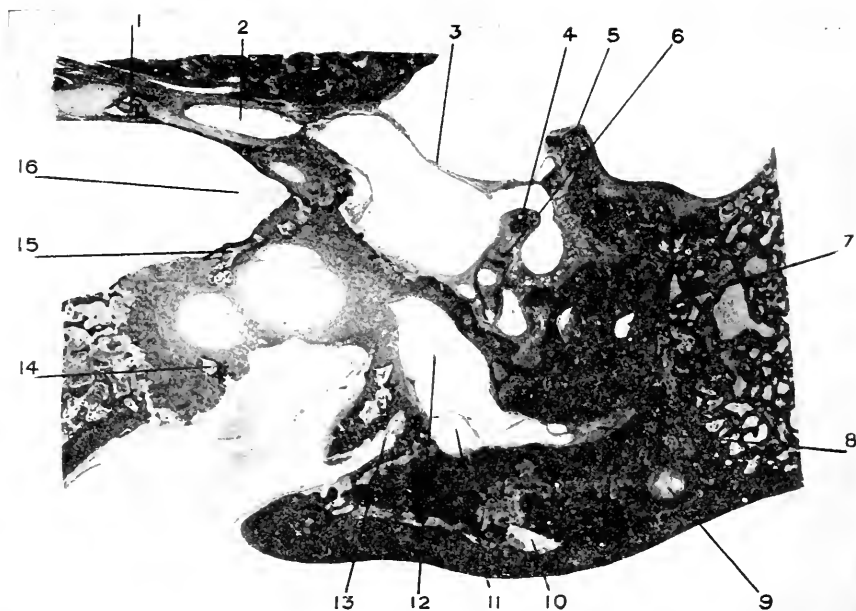


FIG. 4.—Congenital syphilitic disease of the ear. Horizontal section through left ear. (No. 342.) $\times 5$ diam. 1, Junction of cartilaginous and bony tube. 2, Lumen of Eustachian tube. 3, Tympanic membrane. 4, Long process of incus. 5, Chorda tympani nerve. 6, Inco-stapedial joint. 7, Facial nerve. 8, Perilymph space of external canal (smooth end) filled with granulation tissue. 9, Posterior canal with perilymph space obliterated. 10, Upper end of opening for saccus endolymphaticus; the dura has been removed. 11, Lower part of utricle which joins ampulla of posterior canal. 12, Greatly dilated saccule. 13, Nerve to crista of posterior canal. 14, Area of otitis vasculosa (chronic osteomyelitis) between basal coil of cochlea and internal meatus. 15, Otitis vasculosa in anterior part of cochlear capsule between periosteal and lamellar bone. 16, Carotid canal. [Between the dilated portion of the endolymphatic duct (Fig. 18, No. 9) and the saccus endolymphaticus (Fig. 19, No. 10) the endolymph duct appears to have been occluded by the inflammatory changes in the marrow: hence the dilatation of the membranous labyrinth.]

PATHOLOGY.

(1) *In the Fœtus and in Infants.*—Baratoux, Panse, Mayer, Asai, Hofer, Ranke and Gruenberg have microscopically examined the middle and inner ears of syphilitic fœtuses and infants. The changes found by these observers may be summarised as follows: (a) Otitis media is of common occurrence not only in syphilitic

infants but also in syphilitic children born prematurely. (*b*) The infective process in the middle ear has been found to involve the labyrinth in some cases by rupture of the annular ligament and consequent invasion of the vestibule through the oval window. (*c*) Delayed ossification of the labyrinth capsule, with abnormal marrow spaces. (*d*) Intra-uterine meningitis in the region of the

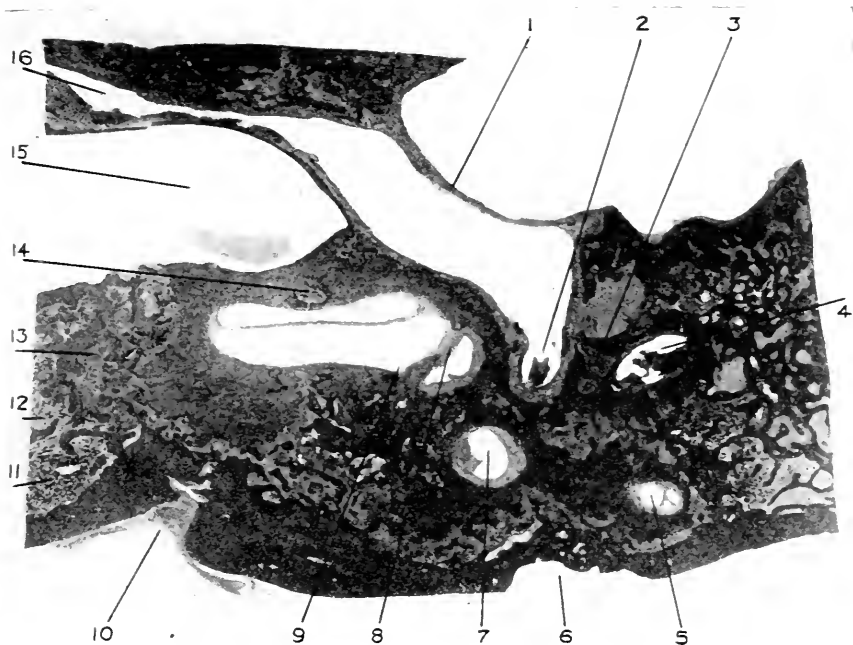


FIG. 5.—Congenital syphilitic disease of the ear. Horizontal section through left ear (No. 428). $\times 5$ diam. 1, Tympanic membrane. 2, Sinus tympani. 3, Stapedius muscle. 4, Facial canal (nerve displaced—artefact). 5, Smooth end of posterior canal partially filled up. 6, Depression for saccus endolymphaticus. 7, Ampullary end of posterior canal. 8, Membrane of round window. 9, Cochlear opening of perilymphatic aqueduct. 10, Cranial end of perilymphatic aqueduct. 11, Normal cellular marrow. 12, Normal fatty marrow. 13, Osteoclastic marrow. 14, Area of otitis vasculosa in cochlear capsule; note the deeply staining bone in the wall. 15, Carotid canal. 16, Eustachian tube.

internal meatus and neuritis (small cell infiltration) of the eighth nerve (Mayer). Ranke has examined the brain of syphilitic infants and found inflammatory changes starting in the pial vessels and spreading into the brain substance. (*e*) Baratonx, in addition to purulent otitis media and interna, has noted changes in the blood-vessels. (*f*) In numerous cases hæmorrhages have been observed in the middle and inner ear, but such findings must be discounted, as they are probably due to suffocation.

Panse, however, holds that the hæmorrhage is of syphilitic origin. (g) Changes in Corti's organ and in other parts of the membranous labyrinth and nerve apparatus, especially the spiral ganglion, have occasionally been noted.

Grnenberg has demonstrated spirochaetes in microscopic sections

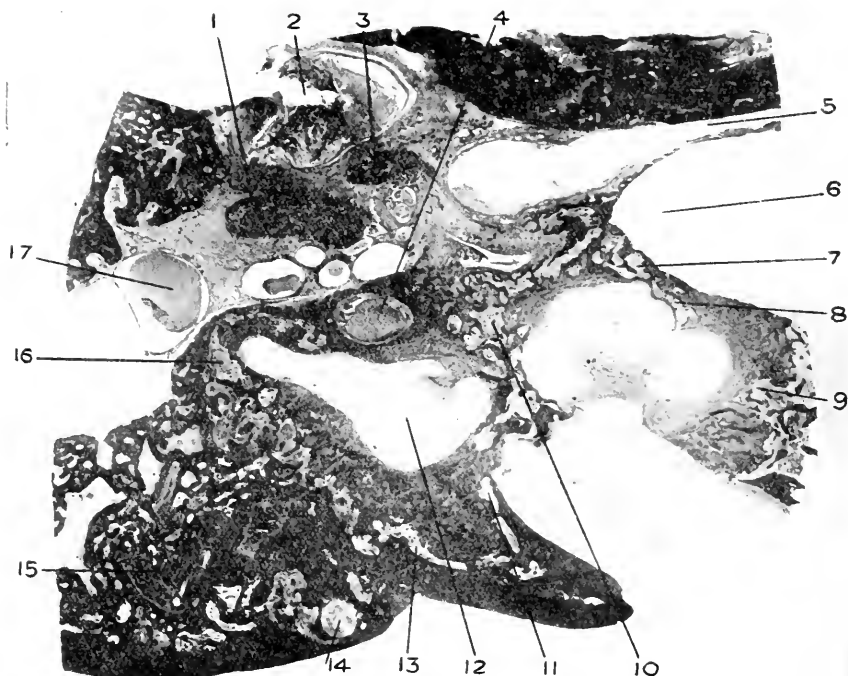


FIG. 6.—Congenital syphilitic disease of the ear. Horizontal section through right ear (No. 152). $\times 5$ diam. 1, Incus. 2, External meatus containing desquamated epithelium and bits of necrosed bone. 3, Malleus in region of short process. 4, Facial nerve. 5, Eustachian tube. 6, Carotid canal. 7, 8 and 9, Areas of ostitis vasculosa (chronic osteomyelitis) in capsule of cochlea. 10, Ostitis vasculosa in cochlear capsule just above and in front of oval window. 11, Ostitis vasculosa near internal auditory meatus. 12, Utricle. 13, Osteoclastic marrow (ostitis vasculosa). 14, Posterior canal obliterated by granulation tissue. 15, Dilated vessels of fossa subarcuata, which here take a knee-shaped bend. 16, Ostitis vasculosa eroding bony wall of external canal. 17, Cavity of aditus containing mucoid material.

from the ear of a seven months' foetus, especially in the cochlear and vestibular nerves, the facial nerve, and in the tympanic and carotid nerve plexuses. Spirochaetes were also found in the vessels of the middle ear and in the marrow spaces of the ossicles. There were, however, no spirochaetes in the hollow spaces of the labyrinth or in the nerve endings in the inner ear.

(2) *In Young Children.*—As far as we have been able to

ascertain there exists at present little or no definite knowledge of the pathological anatomy of the changes which occur in the ears of young children (1-7 years) as the result of congenital syphilis. For this reason we must base our theories on clinical observations. McBride states that, in children suffering from congenital syphilis, what appears to be a case of simple Eustachian catarrh runs an

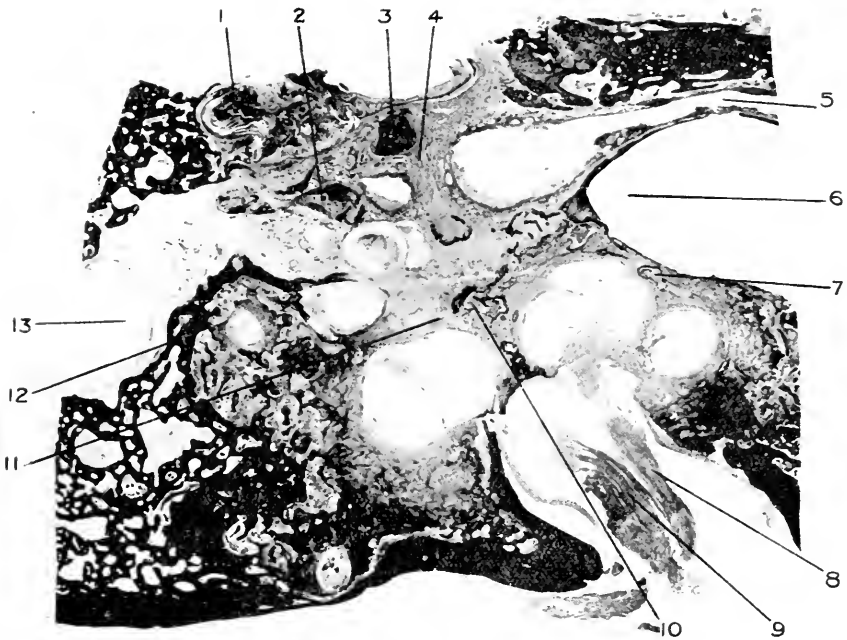


FIG. 7.—Congenital syphilitic diseases of the ear. Horizontal section through right ear (No. 185). $\times 5$ diam. Stained with Kulschitsky hæmatoxylin. 1, Necrosed bone from posterior superior wall of bony meatus surrounded by desquamated epithelium. 2, Incus: note large marrow spaces and erosion of the bone. 3, Malleus. 4, Tendon of tensor tympani. 5, Eustachian tube. 6, Carotid canal. 7, Area of otitis vasculosa in cochlear capsule. 8, Cochlear nerve. 9, Vestibular nerve. 10, Area of otitis vasculosa in anterior margin of oval window. 11, Footplate of stapes in oval window. 12, Osteoclastic marrow reaches the endosteum of the horizontal canal. 13, Mastoid antrum. Note that the nerves (Nos. 9 and 10) are apparently normal.

unfavourable course. Treatment does no good, and the drumheads remain thickened and indrawn, while the deafness is severe and persists. McBride further says that in children hereditary syphilis often gives rise to a combination of middle-ear catarrh and labyrinthine deafness. Alexander holds that catarrhal otitis media is common in syphilitic children, and appears to be a syphilitic manifestation. There is only slight or no improvement after the

absorption of the exudate. The middle-ear symptoms are thus replaced by those of the inner-ear lesion. *These catarrhal affections develop into conditions which clinically correspond to otosclerosis.* Nager states that middle-ear affections in congenital syphilis—as in other severe constitutional anomalies—show a marked tendency to break into the labyrinth.

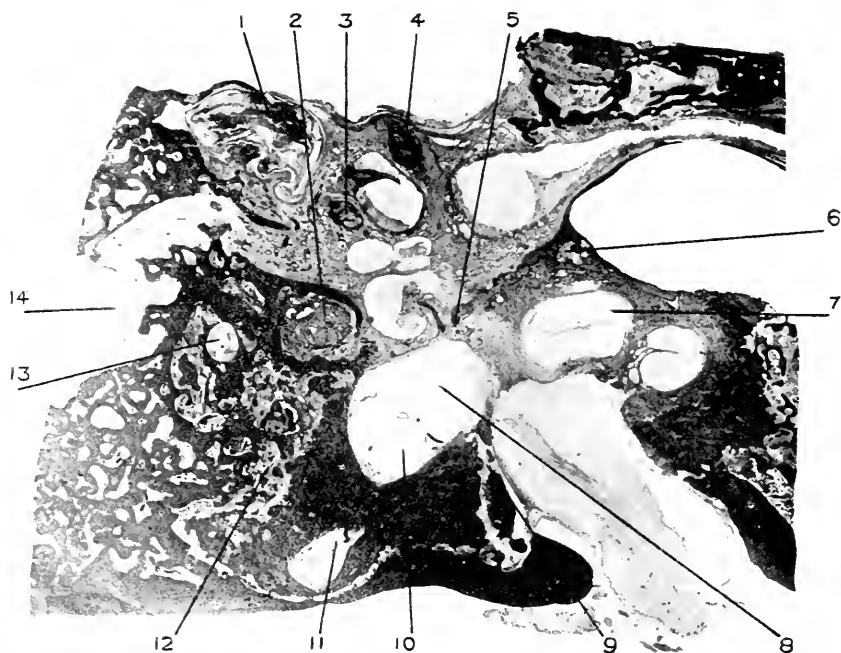


FIG. 8.—Congenital syphilitic disease of the ear. Horizontal section through right ear (No. 205). $\times 5$ diam. 1, Pocket in posterior wall of bony external meatus containing necrosed bone and desquamated epithelium. 2, Facial nerve. 3, Long process of incus. 4, Malleus. 5, Anterior margin of oval window. 6, Area of otitis vasculosa between apex of cochlea and carotid canal. 7, Dilated cochlear canal of middle coil. 8, Greatly dilated sacculus. 9, Marrow changes reach the internal meatus. 10, Utricle. 11, Junction of smooth end of posterior canal with crus commune partly filled with new connective tissue. 12, Osteoclastic marrow. 13, External canal: endolymph space patent, but perilymph space filled up: the canal is surrounded by osteoclastic marrow which reaches the endosteum. 14, Mastoid antrum.

It would thus appear that in young children suffering from congenital syphilis severe deafness may be due to a (syphilitic?) otitis media going on to labyrinthine involvement (syphilitic panotitis of Alexander). On the other hand it is possible, and even likely, that the otitis media may be caused by those organisms which usually give rise to this condition, and that, in the

syphilitic child (1) the labyrinth capsule has such a feeble power of resistance that para- and peri-labyrinthitis supervene, or (2) the window structures give way with resulting infection of the hollow spaces of the inner ear.

(3) *The "Late" Type of Congenital Syphilis.*—In which deafness occurs (gradually or suddenly) between the seventh and

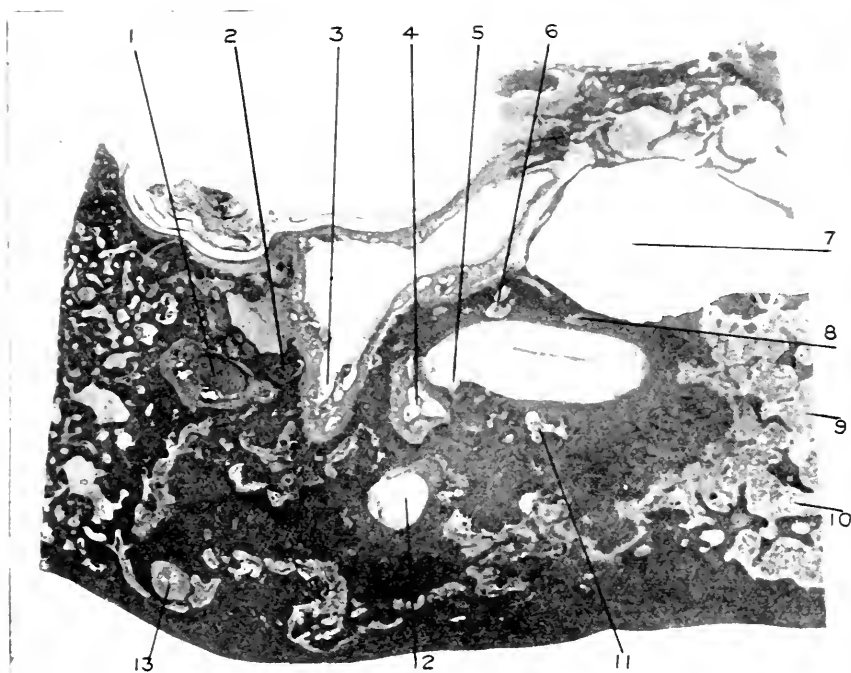


FIG. 9.—Congenital syphilitic diseases of the ear. Horizontal section through right ear (No. 274). $\times 5$ diam. 1, Facial nerve. 2, Stapedius muscle. 3, Sinus tympani. 4, Niche of round window. 5, Cochlear opening of perilymphatic aqueduct filled up with delicate connective tissue which is only faintly seen. 6 and 8, Area of otitis vasculosa in cochlear capsule. 7, Carotid canal. 9, Cellular marrow (normal). 10, Fatty marrow (normal). 11, Area of otitis vasculosa behind basal coil. 12, Ampullary end of posterior canal. 13, Smooth end of posterior canal obliterated by connective tissue and surrounded by osteoclastic marrow.

thirteenth years as a rule.—Interstitial keratitis is almost invariably present, while "Hutchinson" teeth are found in 50 per cent. of cases. Various views have been expressed as to the pathology of this variety of congenital syphilitic deafness. So far microscopic examination of the ears in such cases has been almost entirely lacking as far as the writers have been able to ascertain. Nager mentions two cases in which labyrinthine disease was found to be

combined with a middle ear affection as in the case we are about to record.

The views put forward by various authorities as to the pathology of the "late" form of congenital syphilitic deafness may be summarised as follows:

(a) Siebenmann, Mayer, and others hold that the deafness is due to a *neuro-labyrinthitis spreading from the meninges*. Mayer believes that the deafness is due to a recurrence or an exacerbation of the condition which he and others have found in the internal auditory meatus of still-born syphilitic infants (*vide supra* (1)). The localised meningitis or neuritis is supposed to extend to the nerve structures of the inner ear. It is claimed in support of this view that a lymphocytosis exists in the cerebrospinal fluid in children suffering from congenital syphilis.

(b) *Vascular changes* (endarteritis) and hæmorrhages are held by Baratonx to explain the sudden form of "late" congenital syphilitic deafness.

(c) *Otitis media followed by para- and peri-labyrinthitis or by invasion of the labyrinth through the windows*. Almost all authorities who have written on the subject of the "late" form of congenital syphilitic deafness in its clinical aspect agree that the tympanic membranes are seldom normal. This points to a past attack (or attacks) of otitis media. Politzer states that congenital syphilitic disease of the labyrinth is often associated with middle-ear catarrh or suppuration. Out of thirty-three cases* examined by one of the writers (J. S. F.), the drumheads were normal in only four instances. Gradenigo records the case of a girl (suffering from congenital syphilis) who caught cold after a dance and suffered from tinnitus and rapid deafness. Otorrhœa came on two months later without pain. Within eight months there was disturbance of balancing, made worse by alcohol. When seen one year after the onset "Hutchinson" teeth and interstitial keratitis were found to be present. The left drumhead showed a large perforation, but the right one was normal. Functional examination revealed inner ear deafness. It is unfortunate that cases of "late" congenital syphilitic deafness are seldom or never brought to the clinic for otoscopic and functional examination at the time of the sudden onset of deafness. A detailed report of the conditions found in such a case would be of great interest. We would expect that at least in some of these cases junctional examination of the ear would show "middle-ear deafness" in

* JOURN. OF LARYNGOL., RHINOL., AND OTOL., August, 1909.



FIG. 1.—Right ear. Section 33. $\times 8$ diam. (1) External meatus; (2) head of malleus ankylosed to attic wall; (3) body of incus also ankylosed; (4) cystic space in attic containing mucoid exudate.

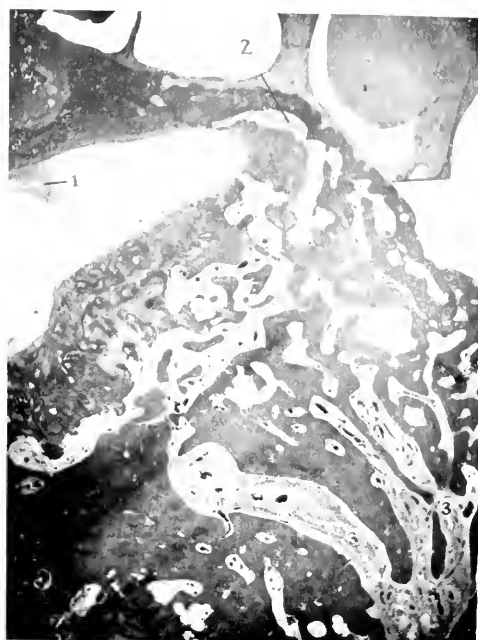


FIG. 2.—Right ear. Section 123. $\times 7$ diam. (1) Crista of external canal; (2) osteomyelitis reaches endosteum; (3) vessels of fossa subarcuata.

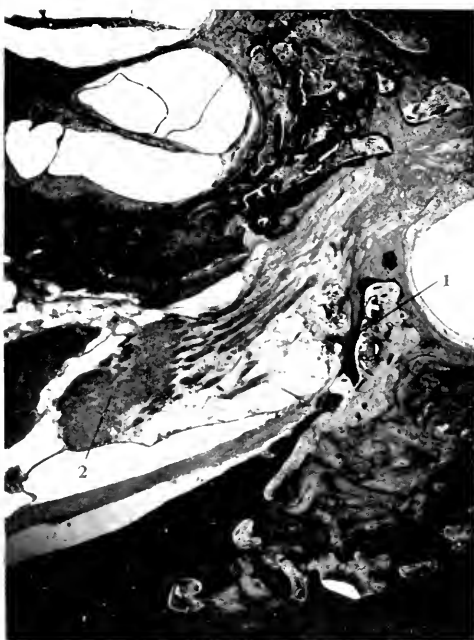
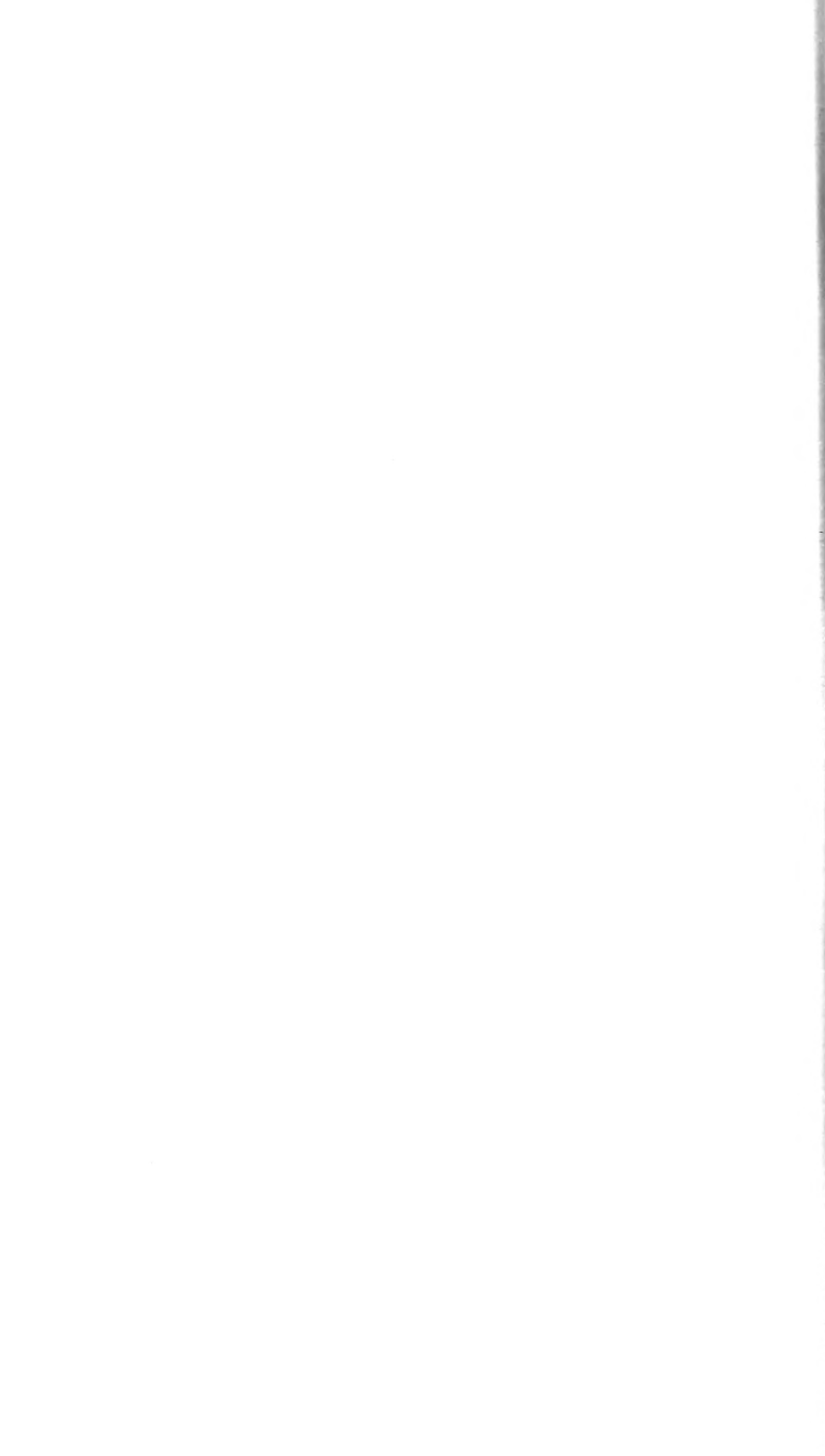


FIG. 3.—Right ear. Section 125. $\times 11$ diam. Marrow changes reach basal coil of cochlea and internal meatus. (1) Osteomyelitis reaches dura mater of internal meatus and causes small cell infiltration; (2) vestibular ganglion.



FIG. 4.—Right ear. Section 165. $\times 7$ diam. (Stained with Kulshitzky hematoxylin.) Shows cochlea and internal meatus. (1) Scala tympani of basal coil partially filled with new connective tissue; (2) greatly dilated scala media which obliterates the scala vestibuli; (3) area of meningitis (small cell infiltration) in internal meatus, next to osteomyelitis in the bony partition, between cochlea and vestibule.



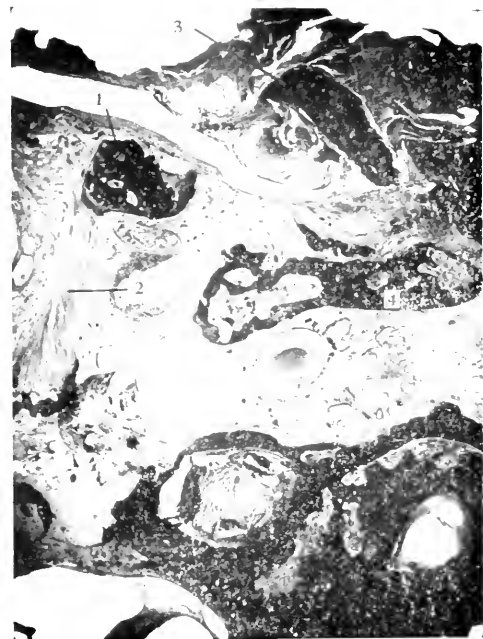


FIG. 1.—Right ear. Section 176. $\times 7$ diam. External meatus and tympanic cavity. (1) Malleus with (2) tendon of tensor attached; 3: necrosed bone being thrown off from posterior wall of bony meatus; (4) short process of incus.



FIG. 2.—Right ear. Section 188. $\times 11$ diam. (1) Anterior margin of oval window with invasion of marrow spaces; (2) footplate of stapes; (3) dilated sacculus; (4) dilated utricle.

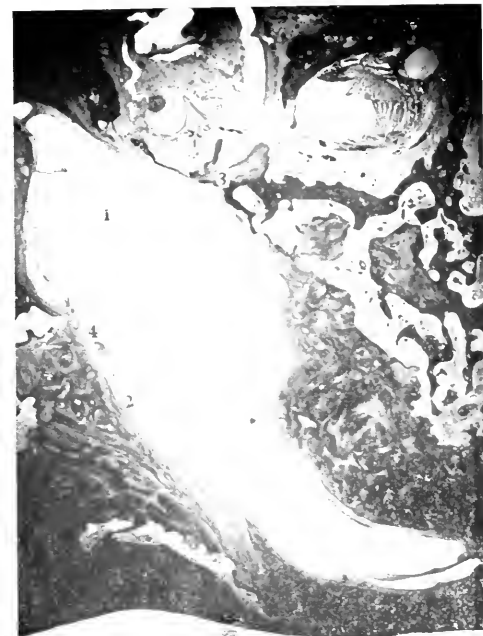


FIG. 3.—Right ear. Section 236. $\times 7$ diam. Shows oval window, vestibule, and crus commune. (1) Dilated sacculus and ductus reunions; 2 dilated endolymph ductus with (4) catarrhal excrecence growing from inner and anterior wall of duct; 3: stapes in oval window.



FIG. 4.—Right ear. Section 236. $\times 134$ diam. Shows catarrhal excrecence from lining membrane of ductus endolymphaticus in the dilated portion near the sacculus.

the early stages of the disease. We hold that, at least in some cases, the "late" form of congenital syphilitic deafness is due to syphilitic otitis media—possibly with mixed infection—which (1) invades the marrow spaces of the petrous and also attacks the labyrinth capsule, giving rise to a chronic form of osteomyelitis which slowly invades the perilymph space of the labyrinth (gradual onset of deafness), or (2) rapidly invades the hollow spaces of the inner ear through the oval or round windows and causes syphilitic panotitis (apoplectiform onset of deafness).

In support of view No. 1 we put forward the following case, for permission to record which we are indebted to Dr. Logan Turner :

D. W.—, male, aged twenty, a blind basket-maker. The father died of aneurysm at the age of thirty-five; the mother states that she had had four still-born children before the birth of the patient; afterwards she had three more still-born children. As a young child the patient could hear well and spoke normally. At the age of four years he had measles followed by double otorrhea, which persisted through life, in spite of careful treatment carried out by his mother. The latter noticed that her son was slightly deaf after the onset of the middle-ear trouble and that the deafness gradually increased. At the age of nine the boy could still hear well enough to attend an ordinary hearing school. At the age of ten the patient had interstitial keratitis, and six months later syphilitic ulceration of the pharynx, followed by contraction. At this period also the deafness markedly increased, and within a year became almost complete. Following the severe syphilitic ulceration of the pharynx enlarged glands (syphilitic or tubercular?) were removed from the neck. The patient's speech soon became very indistinct, but his mother could understand it. The mother states that the boy frequently complained of noises in the ear and giddiness, and that he walked in a peculiar "rolling" manner. For some time before his admission to the Royal Infirmary, Edinburgh, the patient had been very drowsy, and often went to sleep in a chair in the midst of conversation. Examination on admission showed that he was emaciated. The incisor teeth were notched and the corneæ very cloudy. Syphilitic scars were noted round the knees. Wassermann reaction was negative. The patient's breathing was so noisy as to keep the other patients awake at night. Only fluid food could be swallowed. The patient was sent over to the Ear and Throat Department from one of the medical wards for examination of the pharynx and larynx. (It is unfortunate that functional examination of the ear was not carried out.) Examination showed that the nasopharynx was entirely shut off from the mouth and oropharynx by scar tissue. Suspension laryngoscopy was carried out under chloroform anæsthesia and revealed marked cicatricial narrowing of the upper aperture of the larynx—the epiglottis being adherent to the posterior wall of the pharynx. The patient became comatose and died suddenly in the afternoon following this examination. The autopsy showed syphilitic changes in the skull-cap, brain membranes, lungs, heart, aorta, and liver. The brain was markedly œdematous, but has not yet been microscopically examined.

As an example of the "late" form of congenital syphilitic disease of the ear the case is not free from objection—*v. g.* (1) the

Wassermann reaction was negative (this result is frequently met with in cases of congenital syphilis which reach the age of twenty years; (2) the history of suppurative otitis media and presence of a chronic adhesive process in the middle ear (to us this is not an objection, but it may be to others who hold a different view of the pathology of "late" congenital syphilitic deafness; (3) history of enlarged glands removed from the neck (the operation for cervical adenitis followed closely on the syphilitic ulceration of the pharynx. No evidence of tuberculosis was found at the *post-mortem*).

MICROSCOPICAL EXAMINATION OF LEFT EAR.

I. *External Auditory Meatus*.—The inner end of the meatus contains desquamated epithelium, which is peeling off from the outer surface of the drumhead and the adjoining meatal walls. There are also one or two pieces of necrosed bone projecting into the meatus from the region of the posterior-superior bony wall.

II. *Tympanic Membrane*.—This structure is thickened and slightly infiltrated. In the posterior-superior part external to the lower end of the long process of the incus, it is composed of a thin layer of granulation tissue covered in places by irregular epithelium. This appears to have been the site of a former perforation.

III. *Middle-Ear Cleft*.

A. *Eustachian Tube*.—Vertical microscopic sections of the cartilaginous tube show areas of granulation tissue in the cartilage itself. These granulating buds are burrowing into the cartilage, and are accompanied by mono-nucleated and multi-nucleated phagocytes. The lining membrane of the bony portion of the Eustachian tube appears to be fairly normal. There is slight lymphocytic infiltration of the submucosa in the region of the isthmus.

B. *Tympanic Cavity*.—The *attic* is almost obliterated by the oedematous swelling of the submucous tissue, while the bony wall of the anterior part is carious. There are cystic spaces in the submucosa of the attic. These spaces are filled with mucus and contain a few lymphocytes. There is a considerable amount of cellular infiltration and fibrous tissue formation in these spaces.

The mucosa of the *Meso-tympanum* is swollen and infiltrated. The niche of the oval window is filled with oedematous granulation tissue, which invades the facial canal. There is no ankylosis of the foot-plate of the stapes to the margins of the oval window; indeed, the foot-plate is tilted with the anterior end outwards towards the tympanum and the posterior end inwards towards the vestibule. In the lower part of the tympanic cavity there is considerably less change; the free space is not obliterated by the swollen mucosa. The sinus tympani contains some pus. The membrane of the round window is only slightly thickened. The facial nerve itself is normal, but its bony canal is eroded, and shows some increase of fibrous tissue. The chorda tympani appears normal.

c. The *antral* cavity is very small, as it is greatly narrowed by thickening of the submucosa, which consists of oedematous granulation tissues. Cystic spaces are present here as elsewhere.

D. *Tympanic Ossicles and Muscles*.—(1) *Malleus*.—The head of this ossicle is united by bone to the external wall of the attic. The head itself is eroded, and shows a large amount of marrow tissue. The upper part of the handle of the hammer is also markedly eroded by invasion from the submucosa, and in parts is

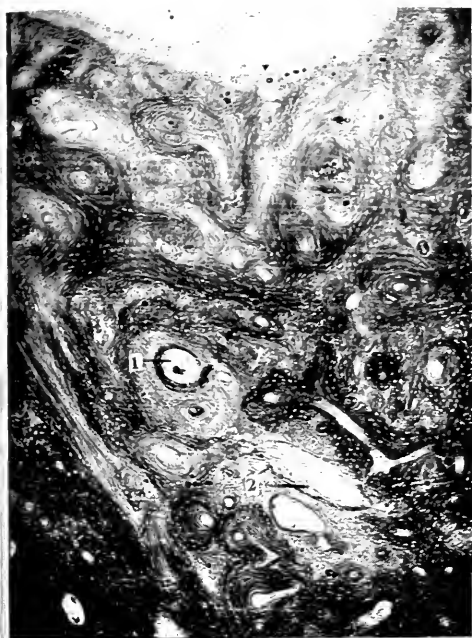


FIG. 1.—Right ear. Section 264. $\times 42$ diam. Bone posterior to vestibule. 1) Vestibular vein; 2) ductus endolymphaticus blocked up. Fig. 1, 3, and 4 explains the dilated conditions of the membranous labyrinth.



FIG. 2.—Right ear. Section 274. $\times 13$ diam. (1) Cochlear opening of perilymphatic duct blocked by new connective tissue; (2) niche of round window; (3) ampullary end of posterior canal.

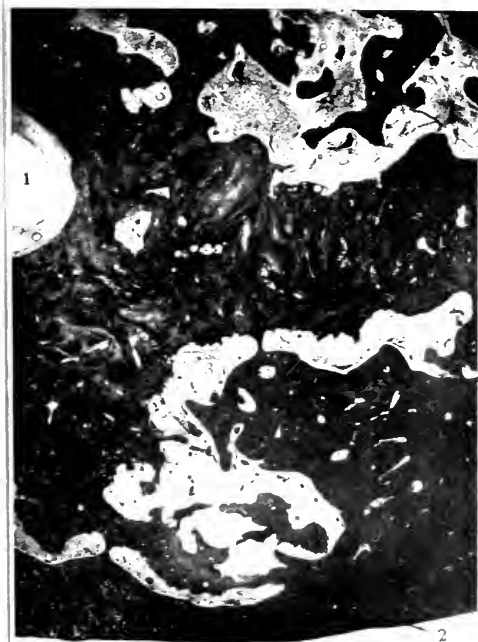


FIG. 3.—Right ear. Section 280. $\times 13$ diam. (1) Ampullary end of posterior canal; (2) posterior cranial fossa; (3) position of ductus endolymphaticus in the granulation tissue (osteomyelitis).

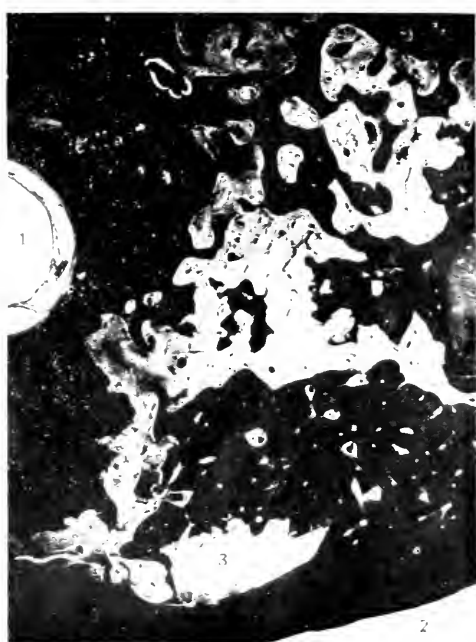


FIG. 4.—Right ear. Section 288. $\times 10$ diam. (1) Ampullary end of posterior canal; (2) posterior cranial fossa; (3) position of sacculus endolymphaticus. Note the large areas of osteomyelitis between the canal and the sacculus.



FIG. 1.—Right ear. Section 228. $\times 24$ diam. (1) osteomyelitis reaches endosteum of lateral canal; (2) new connective tissue in perilymph space; (3) endolymph space.

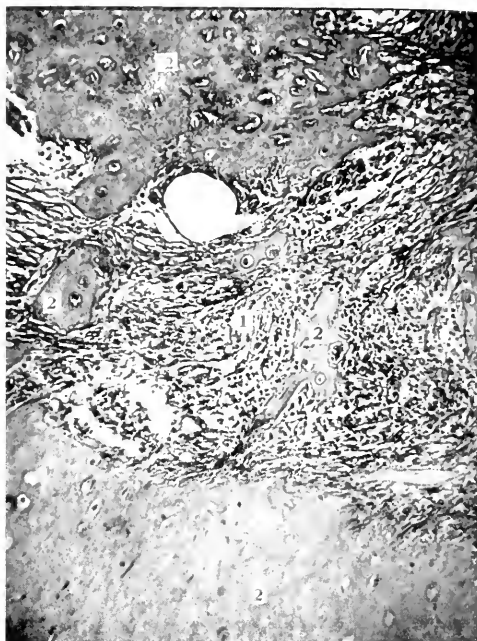


FIG. 2.—Section through Eustachian tube. $\times 112$ diam. Showing areas of granulation tissue in the cartilage; isolated bits of cartilage may be seen in the process of absorption.

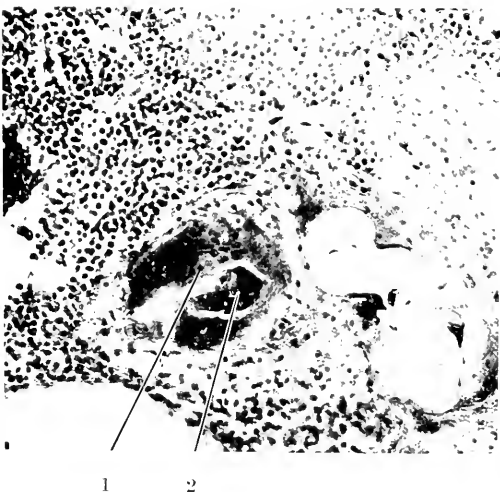


FIG. 3.—Congenital syphilitic disease of the ear. Section through osteoclastic marrow ($\times 200$ diam.) showing large osteoclast with many nuclei; the giant cell contains a bit of necrosed bone. (1) Giant cell; (2) necrosed bone in the giant cell.



FIG. 4.—Right ear. Section 184. $\times 25$ diam. Shows (1) invasion of body of incus from the submucosa of the tympanum; (2) cystic space; (3) ankylosis of incus to external wall of aditus.

almost replaced by granulation tissue. The lower part of the handle has disappeared. The processus cochleariformis is somewhat eroded, but the fibres of the tensor tympani appear to be healthy. The tendon of the tensor, however, is not attached to the handle of the malleus, which has disappeared, but has passed forward with the processus gracilis to the anterior margin of the annulus.

(2) *Incus*.—The incus is bound down to the posterior part of the tympanic cavity by adhesions. There is much marrow tissue in the body and short process of the incus. The body is carious at a point just external to the joint between the malleus and incus, as it has been eroded here by the phagocytic marrow. The cellular marrow extends into the joint between the malleus and incus and almost obliterates the joint space. The long process of the incus is surrounded by swollen and infiltrated mucosa, and is slightly eroded.

(3) *Stapes*.—The crura seem fairly normal, and the joint between the incus and stapes is healthy. The foot-plate of the stapes appears to contain an excess of marrow tissue. The joint between the stapes and the oval window is normal. The stapedius and its tendon are also normal.

IV. *Labyrinth Capsule*.—On the inner wall of the aditus inflammatory changes are seen invading the bony prominence of the lateral (or horizontal) canal. The bone is also invaded from the deep layer of the submucosa of the attic and antrum, and to a less extent from the tympanic cavity in the region of the promontory. At almost all parts of the labyrinth capsule the marrow spaces are very large and contain dense cellular marrow in which are numerous giant cells. These marked changes in the marrow affect the capsule of the cochlea. The abnormal marrow in the cochlea-capsule infiltrates the area between the cartilage bone and the lamellar bone so that the cartilage bone capsule of the cochlea is eroded on all sides. The marrow changes reach the endosteum of the posterior and superior vertical canal and also the internal auditory meatus between the cartilage bone capsule of the cochlea and the lamellar bone formed from the dura mater.

At points distant from the antral and tympanic cavities fatty marrow is present around the dense bony capsule of the labyrinth. The bone which lies next to the phagocytic marrow, i. e. the bone about to be eaten away, is darker than the surrounding bone, as it takes on the basic hamatoxylin stain more deeply. The marrow changes reach the endosteum of the scala vestibuli in the basal coil. There is a marked area of osteoclastic marrow just in front of and above the anterior margin of the oval window in the area in which the early changes of otosclerosis occur.

The bony capsule of the vestibule is markedly eaten out in its posterior part by phagocytic marrow just about the entrance of the crus commune. Here also the marrow-changes reach the endosteum. The inner wall of the *carotid canal* is also eroded by the phagocytic marrow.

The vessels of the fossa subarcuata are very dilated and the fossa itself is large.

V. *Membranous Labyrinth*.—

A. *Cochlea*.—The ductus cochlearis is much dilated in all coils, and Reissner's membrane is markedly bulged upwards or folded. In the intra-vestibular part of the cochlea Corti's organ is absent, while in the lower part of the basal coil Corti's organ is merely a low mass of cells. In the middle coil the neuro-epithelium of Corti's organ appears to be in a somewhat better condition. Corti's organ is absent at the apex of the apical coil. In the scala tympani of the middle coil there is some new connective tissue. The spiral ganglion throughout shows a considerable amount of small cell infiltration, and many of the ganglion cells are shrunken. There is some new connective tissue in the scala tympani just above

the round window, and this tissue extends throughout the basal coil into the middle coil. In the neighbourhood of the cochlear opening of the peri-lymphatic aqueduct there is also some new connective tissue, but the opening of the duct is not blocked, and in its passage through the bone to the posterior cranial fossa the duct is patent. The stria vascularis in all coils shows little change.

(B) *Vestibule*.—The endosteum of the vestibule is normal where it covers the inner surface of the stapes. Both the utricle and saccule are greatly dilated, in fact, the saccule is so dilated that it reaches the inner surface of the foot-plate of the stapes. The neuro-epithelium of the utricle is slightly desquamated. The neuro-epithelium of the saccule seems to be in fairly good condition, but shows a small polypoid projection of granulation tissue into the cavity in the region where the vestibular nerve enters.

The vestibular part of the endo-lymphatic aqueduct along with the ducts from the saccule and utricle are considerably dilated. Further inwards the endolymph duct is obliterated by granulation tissue before it reaches the saccus.

c. *Semi-circular Canals*.—(1) *Superior*.—At both ends of the superior canal the marrow has eroded the cartilage bone. The perilymph space of the canal is much encroached on at the ampullary end by the formation of granulation tissue, which contains blood-vessels of considerable size. The interior of the bony wall of the superior canal is eaten out into small bays by the granulation tissue. The endolymph space shows some coagulated lymph. The smooth end of the superior canal is obliterated to a large extent by granulation tissue, which has invaded the perilymph space from the phagocytic marrow in the neighbourhood. The crista of the superior canal is a very low mound of neuro-epithelium. The latter appears to be degenerated and stains very feebly. The cupula is absent.

(2) *External Canal*.—The bony wall of the external canal is eroded in several places by the phagocytic marrow. At the convexity the hollow space of the external canal is entirely obliterated by the formation of granulation tissue which contains numerous giant cells. At the point where the smooth end of the external canal joins the vestibule the granulation tissue filling the perilymph space does not extend into the vestibule.

The crista shows slight desquamation of the neuro-epithelium but the cupula is present. The perilymph space of the external canal contains granulation tissue which has invaded the space from the phagocytic marrow.

(3) *Posterior Canal*.—The smooth end of the posterior canal is almost completely filled up by granulation tissue, and the bony wall of the canal shows marked erosions in the former position of the endosteal lining. The marrow changes in the bone surrounding the posterior canal reach the endosteum and cause a bulging into the perilymph space. The neuro-epithelium of the crista of the posterior canal is slightly desquamated but the cupula is present.

The crista quarta is present.

Internal Auditory Meatus.—The posterior wall of the meatus is eroded by the osteoclastic marrow, and there is some small cell infiltration in the fundus at this point. The facial nerve appears to be healthy. The fibres of the cochlear and vestibular nerves appear normal, but a few of the cells of the vestibular ganglion are shrunken and there is a slight small cell infiltration of the ganglion. There are one or two small hæmorrhages in the internal meatus.

MICROSCOPICAL EXAMINATION OF RIGHT EAR.

I. *External Meatus*.—The inner end of the meatus in its upper part contains desquamated epithelium and several bits of necrosed bone. The latter are being thrown off from the posterior superior wall of the canal.

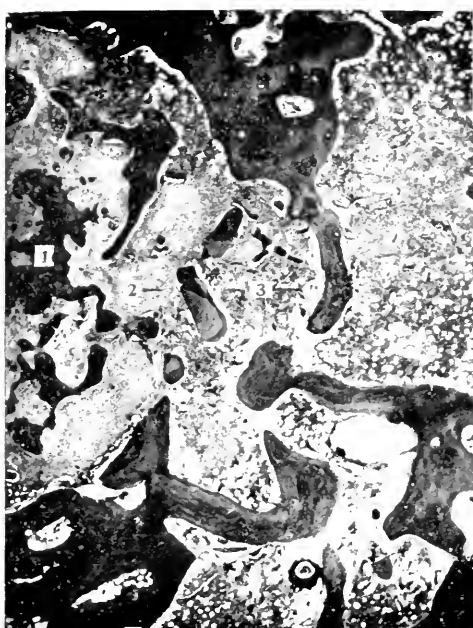


FIG. 1.—Left ear. Section 78. $\times 13$ diam. Showing different kinds of marrow. 1. Capsule of cochlea; 2. granulation tissue change in marrow; (3) leucoblastic reaction; (4) fatty marrow.

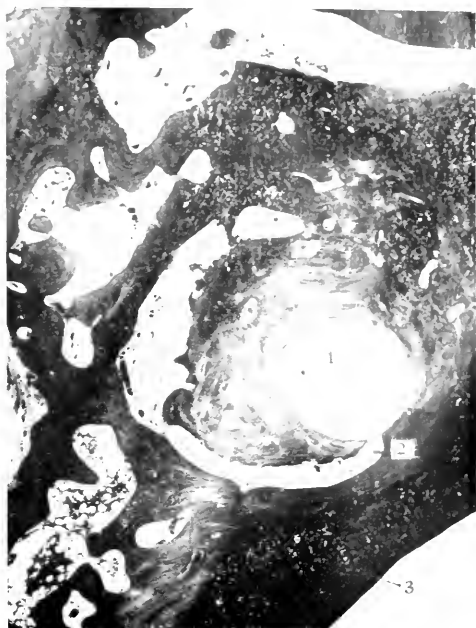


FIG. 2.—Left ear. Section 108. $\times 16$ diam. Shows marrow changes around smooth end of superior canal. (1) Lumen of canal partly filled by new connective tissue; (2) osteomyelitis reaches end of canal; (3) posterior cranial fossa.



FIG. 3.—Left ear. Section 126. $\times 11$ diam. 1. Roof of external meatus with necrosed bone and desquamated epithelium; 2) mallear ankylosis to attic wall; (3) incus. Note invasion of marrow spaces from submucosa. (4) Cystic space containing mucoid exudate.



FIG. 4.—Left ear. Section 144. $\times 10.00$ m. 1. Crista of external canal; (2) new connective tissue in perilymph space in contact with the perilymphatic space; (3) pyogenic marrow invading the labyrinth capsule. (For convenience the section has been rotated through 90 degrees.)

TO ILLUSTRATE MR. J. S. FRASER'S AND MR. R. MUIR'S ARTICLE ON THE PATHOLOGY OF CONGENITAL SYPHILITIC DISEASE OF THE EAR.



FIG. 1.—Left ear. Section 216. $\times 10$ diam. (1) Cavity of utricle; (2) osteoclastic marrow extending to dura mater lining internal meatus. Note slight small cell infiltration within arachnoid sheath. (3) Area of osteomyelitis internal to basal coil of cochlea.

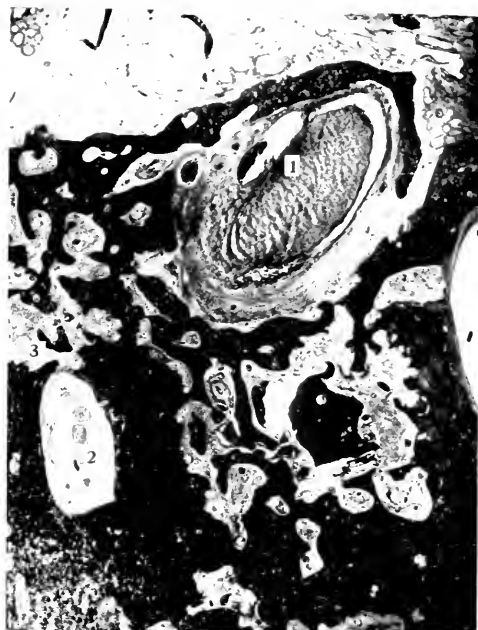


FIG. 2.—Left ear. Section 264. $\times 10$ diam. (1) Facial nerve; (2) new connective tissue and giant cells filling perilymph space of external canal and in contact with (3) phagocytic marrow.



FIG. 3.—Left ear. Section 276. $\times 12$ diam. Shows condition of (1) neuroepithelium of sacculus; (2) area of osteomyelitis in labyrinth capsule.



FIG. 4.—Left ear. Section 288. $\times 11$ diam. (1) External meatus with desquamated epithelium; (2) position of handle of malleus; (3) tensor tympani attached to anterior part of annulus; (4) long process of incus eroded; (5) cystic space—remains of tympanic cavity.

II. *Tympanic Membrane*.—This is thickened and slightly infiltrated with small cells. The outer surface is desquamating. The membrane is not perforated.

III. *Middle Ear Cleft*.

A. *Eustachian Tube*.—There is considerable small cell infiltration of the submucous layer in the region of the isthmus. In the tubal part of the tympanic cavity there is a mucoid exudate. The surface epithelium of the tube is almost normal.

B. *Tympanic Cavity*.—The attic is almost completely filled by the oedematous submucous connective tissue, which contains cystic spaces—the remains of the cavity of the attic. The tympanic cavity itself is partly filled with muco-pus, and the mucous membrane is swollen and infiltrated. In the upper part of the tympanic cavity there is a marked adhesive process, so that little free space remains. The hollow of the stapes is filled with pus, and the mucous membrane of the sinus tympani and of the round window niche is swollen and infiltrated. The chorda tympani is embedded in oedematous connective tissue, as is also the long process of the incus. A sequestrum surrounded by cholesteatoma is being thrown off from the posterior meatal wall just behind and external to the long process of the incus. The vessels which pass into the bone from the deep layer of the submucosa in the upper part of the tympanic cavity are greatly dilated, and the spaces around them are very wide. The facial canal is dehiscant just behind the oval window, and a dense mass of connective tissue surrounds the facial nerve in this region.

C. *Mastoid Antrum and Air Cells*.—There are large cystic spaces in the submucosa filled with mucoid material. The mucous membrane of the "border" cells is so swollen that there is hardly any lumen to be seen. On the inner wall of the antrum the bone is eroded at many spots, and dilated vessels surrounded by connective tissue may be seen entering the bone from the deep layer of the submucosa in these areas.

D. *Tympanic Ossicles, Joints, and Muscles*.—(1) *Malleus*.—The head of this ossicle consists almost entirely of marrow spaces, and its surface is markedly eroded. The head of the malleus is fused to the external attic wall. The handle of the malleus is present, but is eroded, even on the surface which is attached to the drumhead. The tensor tympani is normal, and the tendon of this muscle is attached to the malleus in the usual way.

(2) *Incus*.—The upper part of the body of the incus is fused with the external wall of the attic. The joint cavity between the malleus and incus is filled with granulation and fibrous tissue. The body of the incus shows very wide marrow spaces, and is markedly eroded, as is also the long process. One sees very clearly a vessel entering the incus from the swollen submucous tissue.

(3) *Stapes*.—The crura of this ossicle are normal, but there is granulation tissue in the inner surface of the foot-plate between the bone and the endosteum. The annular ligament is slightly infiltrated by small cells, but there is no fixation of the stapes in the oval window. The joint between the incus and stapes is normal, and the stapedius muscle appears healthy.

IV. *Labyrinth Capsule and Surrounding Marrow*.—Close to the cartilage bone of the labyrinth capsule the marrow is replaced by granulation tissue, and shows numerous giant cells. Further out the marrow is very cellular (leucoblastic reaction), while at points still further removed from the labyrinth capsule the marrow is fatty. The changes in the marrow are seen to pass in along the vessels from the deeper layer of the tympanic submucosa. There is marked erosion of the bone in the inner wall of the tympanic cavity, attic, aditus, and antrum. This is especially seen in the region of the lateral semicircular canal,

the processus cochleariformis, the inner wall of the antrum, the upper part of the promontory, and at the apex of the cochlea. In the anterior margin of the oval window there are marked marrow changes surrounded by bone which stains deeply with hæmatoxylin. Here and there throughout the specimen small bits of deeply staining bone are seen embedded in the osteoclastic marrow. These changes are most marked in the region of the canals, less marked around the capsule of the vestibule and cochlea. The marrow spaces around the canals show marked vascular dilatation. The marrow changes are well seen in the lymph or marrow space which separates the lamellar bone from the cartilage bone of the cochlear capsule, and extend into the area between the cochlea and the carotid canal. The marrow changes also occur posteriorly in the region of the crus commune. In many situations the changes in the marrow reach the endosteum. This is more frequently seen in the lateral canal than in the other canals and vestibule, and is least marked in the capsule of the cochlea. The ductus endolymphaticus cannot be traced in the bone behind the vestibule where the aqueduct passes to the sacculus. Posteriorly the marrow changes reach the dura mater of both walls of the internal auditory meatus. The vessels of the fossa subarcuata are engorged. The junction of these vessels with those of the marrow spaces surrounding the labyrinth capsule is clearly seen.

V. *Membranous Labyrinth.*

A. *Cochlea*.—The ductus cochlearis is greatly dilated in all coils. The dilatation is most marked in the basal coil. The ductus reuniens is very wide. In the intravestibular part of the cochlea, Corti's organ can hardly be recognised. It is replaced by a low mound of cells. In the upper part of the basal coil one sees a small irregular layer of cells representing Corti's organ, but there are no pillar cells. In the middle coil the scala media is so dilated as almost to obliterate the scala vestibuli. In the lower part of this coil Corti's organ somewhat approaches the normal in appearance, but in the upper part of the coil Corti's organ is absent and the membrana tectoria ends in a club-shaped extremity, as in certain deaf-mutes. In the apical coil Corti's organ is absent. In the upper part of the middle coil the basilar membrane is split into two layers.

The cells of the spiral ganglion appear shrunken, and there is an increase in the connective tissue along with small cell infiltration in the hollow spaces of the spiral canal; the bony spiral lamina appears to be almost empty.

In the perilymph space, just above the round window membrane in the region of the cochlear opening of the perilymphatic aqueduct, there is a considerable amount of connective tissue which contains blood-vessels.

B. *Sacculæ and Utricule*.—The sacculæ and utricule are greatly dilated, especially in the lower part. The neuro-epithelium is desquamated but the otolith membrane is still present. The sacculæ is so dilated that it reaches the endosteum covering the foot-plate of the stapes. There is no proliferation of connective tissue in the perilymph space, but the veins which leave the vestibule along with the endolymphatic aqueduct are dilated. The ducts which lead from the sacculæ and utricule to the endolymphatic duct are considerably dilated, and there is a papillomatous proliferation in the duct from the sacculæ to the endolymphatic duct. Further down and back in the bone—internal to the ampullary end of the posterior canal—the aqueductus endolymphaticus is blocked by small cells. Still further back it is lost in the granulation tissue just above the point where it should open into the sacculus.

C. *Canals*.—(1) *Superior Canal*.—There is connective tissue in the perilymph space of this canal, especially at the smooth end, where the granulation tissue has almost obliterated the endolymph space. These changes are in contact with the



FIG. 1.—Left ear. Section 308. $\times 11$ diam. Shows dilated and narrow parts of ductus endolymphaticus. (1) Dilated sacculus; (2) utricle; (3) dilated part of ductus endolymphaticus; (4) narrow part surrounded by osteomyelitis.

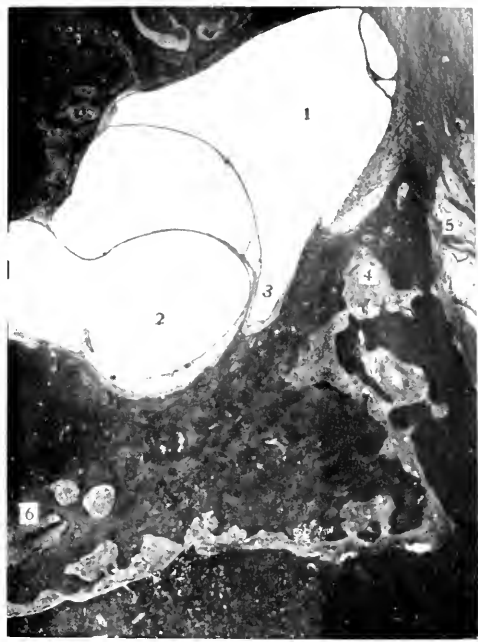


FIG. 2.—Left ear. Section 312. $\times 11$ diam. Oval window and vestibule. (1) Greatly dilated sacculus; (2) utricle; (3) duct from sacculus to endolymphatic duct; (4) abnormal marrow; (5) vestibular nerve; (6) endolymph duct embedded in granulation tissue.



FIG. 3.—Left ear. Section 340. $\times 11$ diam. (Kul-schitzky haematoxylin.) (1) Sacculus; (2) basal coil of cochlea; (3) vestibular nerve with small cell infiltration; (4) area of osteomyelitis near nerve to ampulla of posterior vertical canal.



FIG. 4.—Left ear. Section 340. $\times 210$ diam. (Kul-schitzky stain.) (1) Vein in modiolus; (2) Spiral ganglion of basal coil, showing atrophy of nerve cells.

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Adlard & West Newman.



FIG. 1.—Left ear. Section 342. $\times 11$ diam. (1) Carotid canal; (2) area of osteomyelitis in capsule of cochlea between cartilage and lamellar bone; (3) dilated cochlear duct of middle coil; (4) dilated cochlear duct of basal coil.



FIG. 2.—Left ear. Section 420. $\times 11$ diam. Note areas of osteomyelitis. (1) Pus in sinus tympani; (2) niche of round window; (3) cochlear opening of perilymphatic duct; (4) ampullary end of posterior canal.

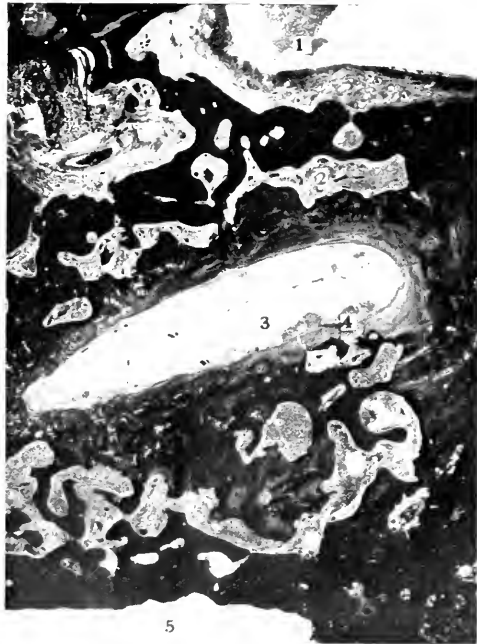


FIG. 3.—Left ear. Section 176. $\times 11$ diam. (1) Sinus tympani; (2) osteomyelitis due to invasion from submucosa; (3) perilymph space partly filled with (4) granulation tissue; (5) position of saccus endolymphaticus.

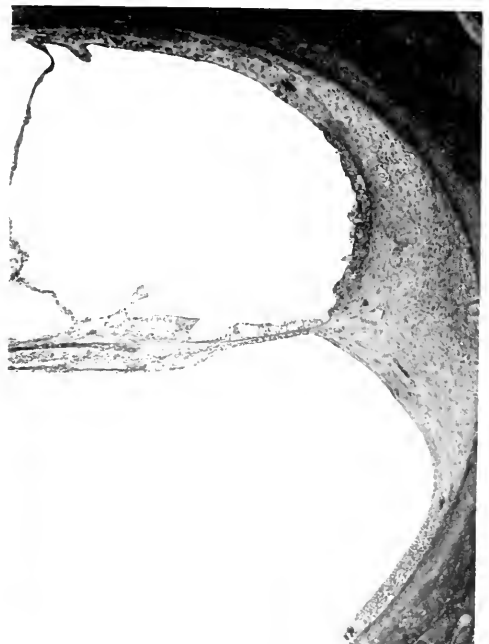


FIG. 4.—Left ear. Section 320. $\times 50$ diam. Shows condition (degenerative neuritis) of Corti's organ in basal coil.

phagocytic marrow which has eroded the bony wall of the canal. There are large vessels full of blood in the granulation tissue at the smooth end of the superior canal. The neuro-epithelium of the crista is desquamated and the cupula is displaced.

(2) *Lateral (External) Canal*.—At the convexity the perilymph space is obliterated by connective tissue, but the endolymph space is patent. Towards the two ends of the canal the perilymph space is more patent. In this canal also the marrow changes are in contact with the new connective tissue, filling the perilymph space. The crista of the external canal appears to be in fairly good condition. The vessels of the perilymph space are dilated and engorged.

(3) *Posterior Canal*.—Here, again, the perilymph space is almost obliterated at the convexity but more patent near the vestibule. Towards the crus commune peri- and endolymphatic spaces are obliterated by the cellular connective tissue. Large blood-vessels are present in the perilymph space. The crista of the posterior canal is well formed and the cupula is present.

Internal Meatus.—As before stated the marrow changes reach the dura mater, especially in the upper and posterior part of the fundus, and there is some small cell infiltration within the arachnoid sheath in this region. The vestibular and cochlear nerves appear almost normal and the vessels show no syphilitic change.

In view of our findings, it is interesting to note that Beck (*Laryngoscope*, 1915, p. 154) has taken a stereo-radiogram of the ear in a case of active syphilitic labyrinthitis, and has found a large area of rarefaction in the labyrinth capsule. Beck considers that this appearance was due to a syphilitic osteoporosis.

Hennebert was the first to call attention to the presence of "compression" nystagmus in some cases of congenital syphilitic disease of the ear. Increase of air-pressure in the external meatus by means of a valveless Politzer bag causes a slow movement of the eyes to the same side, while aspiration brings about a slow movement to the opposite side. Hennebert finds that in these cases the rotation reaction is always absent, while the caloric reaction is reduced. Buys and Alexander have also reported cases. Alexander thinks that Hennebert's sign is due to a change in the nerve endings, while Barany holds that it is due to excessive mobility of the stapes. We believe that our findings (*vide supra*) in congenital syphilitic disease of the ear point to another explanation—namely, that the bony wall of the external canal is eroded by inflammatory changes in the marrow, and that the hollow space of the membranous canal is occluded by syphilitic granulation tissue in the perilymph space, so that the rotation reaction cannot be produced. The vertical canals may also be affected, so that the caloric reaction is feeble or absent. The more powerful pneumatic test is, however, able to bring about an abnormal (reversed) fistula symptom.

Walker Downie's classical case appears to us to support our

view of the pathology of congenital syphilitic deafness—*i. e.* that the condition is due to paralabyrinthitis, followed by peri- or panlabyrinthitis, caused by otitis media in a syphilitic subject. Downie's patient became deaf at the age of eleven years, the deafness being accompanied by severe pain in both ears, though there was never any discharge. (We all, however, recognise that that many cases of otitis do not suppurate or discharge.) The deafness became complete in six months. Otoscopy showed the drumheads to be indrawn and opaque. The patient died from meningo-encephalitis resulting from a fungating gumma of the right parietal bone. Macroscopic examination of the ears showed that the seventh and eighth nerves were healthy. The middle ears were normal, but the stapes was ankylosed in the oval window. (We know that an otitis media may pass off and leave little or no trace. The fact that the mucosa of the middle ear appears normal on naked-eye examination does not prove that it has always been normal.) The semicircular canals were obliterated, and the vestibule largely filled up by new bone formation. The modiolus of the cochlea was thickened. These findings seem to correspond with a stage of sclerosis and ossification following an attack of panlabyrinthitis—secondary to otitis media. They do not appear to be consistent with a neuritis of the cochlear and vestibular nerves spreading to the labyrinth, because the stapes was ankylosed and the canals more severely affected than the cochlea.

SUMMARY OF THE CHANGES FOUND IN THE PRESENT CASE.

I. *Chronic adhesive process* in the tympanic cavity, especially in the upper parts. The submucosa is greatly thickened, and shows cystic spaces filled with muco-pus, but there is no perforation of the tympanic membrane.

II. *Ankylosis of the malleus* (and incus on the right side) to the external attic wall.

III. *Necrosis and exfoliation of bone* from the posterior-superior wall of the external meatus.

IV. *Invasion of the labyrinth capsule* from the deep layer of the swollen and infiltrated submucous tissue of the attic, aditus, and antrum, and to a less extent from the submucosa of the lower part of the tympanic cavity.

V. *Marked changes in the marrow* surrounding the labyrinth capsule, of the nature of a chronic osteomyelitis. These changes in the marrow are continuous, with the inflammatory process spreading in from the deep layer of the submucosa of the middle

ear. The marrow around the labyrinth capsule shows marked leucoblastic reaction, while that in immediate contact with the cartilage bone of the labyrinth capsule is converted into granulation tissue, and shows numerous giant cells, but no caseation.

VI. *Erosion of the bony capsule of the labyrinth* by the phagocytic marrow to such an extent that the inflammatory changes reach the endosteum of the labyrinth, especially in the region of the three semicircular canals. The bone which is being eaten away stains very deeply with basic stains, *e. g.* hæmalum or hæmatoxylin. The alteration in the staining reaction of the bone appears to be due to toxic influence.

VII. *Filling up of the perilymph space of the canals*—especially at their convexities—by granulation tissue which contains giant cells and *compression or obliteration of the endolymph space* in these regions.

VIII. *Obstruction of the endolymphatic aqueduct* as it passes through the bone to the posterior cranial fossa.

IX. *Great dilatation of the membranous labyrinth*—especially of the utricle, saccule, vestibular end of the endolymphatic duct, and ductus reuniens, along with the basal and middle coils of the cochlea.

X. *Formation of new connective tissue in the scala tympani* just above the round window, and to a less extent in the scala tympani of the basal and middle coils of the cochlea. *On the right side the cochlear opening of the peri-lymphatic aqueduct appears to be blocked*, but on the left side it is patent.

XI. *Secondary degenerative neuritis of the nerve structures of the membranous labyrinth.* This is especially marked in the basal and apical coils of the cochlea, but less marked in the middle coil. The neuro-epithelium of the saccule, utricle, and ampullæ of the canals has not suffered to the same extent as that of the cochlea. The cochlear ganglion shows atrophy of the cells in all coils—especially in the basal coil—but the vestibular ganglion shows less marked changes. The facial nerve appears healthy throughout, while any changes present in the stem of the cochlear and vestibular nerves are very slight.

XII. *Slight small cell infiltration within the arachnoid sheath at the fundus of the auditory internal meatus (meningitis)*; this appearance is only seen in the area where the marrow changes penetrate the dural and arachnoid sheaths of the nerves.

REMARKS.

Our explanation of the appearances found in the middle and inner ears of the present case are as follows: The patient undoubtedly suffered from congenital syphilis and at the age of nine years still had the spirochæte present in his blood and therefore in the vessels of the tympanic mucosa and marrow spaces around the labyrinth. At this period he suffered from an exacerbation of his chronic purulent otitis media as the result of severe syphilitic ulceration of the pharynx. Instead of passing off the infective process in the middle ear invaded the labyrinth capsule from the deep layers of the submucous tissue and gave rise to a chronic form of osteomyelitis which invaded the marrow spaces surrounding the cartilage bone capsule of the labyrinth. In time the cartilage bone was attacked and in many places the phagocytic marrow reached the endosteum—especially in the region of the semicircular canals—perforated the lining membrane of the bony labyrinth and gave rise to the formation of granulation tissue containing giant cells in the perilymphatic space. In the capsule of the cochlea the inflammatory process spread in the marrow or lymph space between the lamellar and cartilage bone after invading the promontory from the anterior margin of the oval window. The pathological changes present in this case are not unlike those seen in cases of otitis vasculosa—the early stage of otosclerosis—but they are much more marked and extensive than those usually found in this condition. They are probably analogous to the conditions found in those cases of “congenital” deafness in which areas of otitis vasculosa have been observed in the labyrinth capsule. We believe that many cases of otosclerosis arise in exactly the same way as the conditions found in the present case, *i.e.* by invasion of the vascular spaces of the labyrinth capsule from the mucosa of the middle ear.

In our opinion the nerve structures of the labyrinth were involved secondarily by degenerative neuritis. The almost negligible amount of small cell infiltration (meningitis) in the internal meatus appears to us to have been due to the marrow changes reaching the dural and arachnoid sheaths of the nerves at the fundus of the internal meatus and extending through these sheaths into the subarachnoid space. There does not appear to have been any extension of a basal lepto-meningitis along the internal meatus. (The œdematous brain has not yet been examined). The labyrinthine vessels show no syphilitic changes.

Abnormal conditions of the marrow surrounding the labyrinth capsule have been frequently observed on microscopic examinations of the ears of syphilitic fetuses and infants. These changes may be due to syphilitic infection through the blood stream or to invasion of the marrow spaces from the submucous tissue of the tympanic cavity as a result of otitis media, which appears to be present in a very large proportion of syphilitic fetuses. The changes observed in the present case are only what we should expect to occur from a further extension of the changes already observed by others in these syphilitic fetuses.

The generally accepted view as to the pathology of congenital syphilitic deafness is that this condition is due to a syphilitic neuro-labyrinthitis, but *hitherto this view has not been confirmed by microscopic examination.* Nager states that up to the present time two cases have been examined in which the labyrinth trouble was complicated by disease of the middle ear (as in the present case). Nager further states that only one case of the pure labyrinthine form of the disease has been examined. (He presumably refers to Walker Downie's observation, which unfortunately did not include microscopic examination.) It appears to us that Walker Downie's findings—thickened tympanic membranes, bony ankylosis of the stapes and extensive filling up of the hollow spaces of the labyrinth by new bone—are more compatible with our view of the pathology of congenital syphilitic ear disease than with the "neuro-labyrinthitis" theory. *The changes observed by Downie appear to us to correspond to a stage of sclerosis and ossification following para- and peri-labyrinthitis of a syphilitic nature,* while those observed by us in the present case are still of a more active or inflammatory kind.

The changes in the membranous labyrinth and in the nerve ganglia in the present case appear to us to be secondary to those in the middle ear and labyrinth capsule. They are of the nature of a secondary degenerative neuritis and are not at all like what one would expect to result from "a diffuse gummatous infiltration of the hollow spaces of the labyrinth" or even from a "syphilitic invasion of the inner ear as a result of meningitis spreading from the internal meatus."

According to Alexander (*vide supra*) cases of otitis media occurring in young children who suffer from congenital syphilis, develop into conditions which clinically correspond to otosclerosis. This view fits in exactly with the findings in the present case. In our opinion otitis media plays a much more important part in the production of congenital syphilitic deafness than has hitherto been

supposed. It appears probable that in congenital syphilis, as well as in at least some cases of otosclerosis, there is a special vulnerability of the labyrinth capsule—a lack of resistance to the inward spread of inflammatory processes which may invade the middle ear.

It may be that there are cases of congenital syphilitic deafness (late form) which are due to “neuro-labyrinthitis” from blood or meningeal infection, but, if so, they have still to be proved by microscopic examination.

We gratefully acknowledge a grant from the Moray Fund of Edinburgh University towards the expenses incurred in publishing this paper and the preceding one on the “Pathology of Otosclerosis.”

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SOCIETIES' PROCEEDINGS.

PROCEEDINGS OF THE AMERICAN LARYNGOLOGICAL ASSOCIATION.

Niagara Falls, Canada, June 1, 2, 3, 1915.

(Continued from Vol. XXXI. p. 526.)

Tonsillectomy in the Adult.—Are we justified in doing so many indiscriminate Tonsillectomies for Remote Infection?—Charles W. Richardson.—The paper deals with the ingrained feeling in the profession that the tonsils are probably the sole focal source of general infection. This view has extended not only into the general profession, but has also become an obsession of the laity, so that there are a great many cases of tonsillectomy which are operated upon, in all probability, with an imperfect study of the cases, and the want of proper realisation of the relation of cause and effect.

He also calls attention to the number of other focal sources of general infection. He stated that there was no question of the necessity of tonsillectomy in a certain class of cases, where there was decided pre-existing or present evidence of local disease. He doubted whether there was any necessity of removing the tonsils, except in unusual cases where there was no evidence of disease or tenderness or hypertrophy, wherein there was general infection, simply for the purpose of correcting such a condition. Dr. Richardson also disapproved of the removal of tonsils where there was simply the history of a previously existing case of tonsillitis preceding general infection, and where the tonsils seemed absolutely normal at subsequent inspections. A number of cases were given to bear out these contentions.

Dr. HENRY L. SWAIN: The ideal way is for the general practitioner to send patients to us to ask if the tonsils should be removed, but most of us are confronted with the exactly opposite condition. The nurse, the relatives, or others will send a patient to the hospital "to have the tonsils removed." Some tonsils certainly do not need to be removed. Tonsillectomy is undoubtedly performed in many cases in which it is not needed. That is wrong. Any method which will lead to some way of estimating quickly and accurately as to whether a tonsil should or should not come out would be of tremendous advantage.

Dr. G. HUDSON MAKUEN: I have had several letters from Dr. French concerning his work. He promises to bring this subject before us at our next meeting in Washington. He is now able to tell whether or not a tonsil is diseased. He thinks he will be able to look in the mouth and tell whether or not pus or detritus of any sort is there, and whether or not it should be removed. It is not a question of whether or not the tonsil should be removed, but what should be done; it is a question of the prevention of the trouble, just as the prevention of sinusitis is advocated. The cases of which I am proudest are those in which I have done the least operation. When pus is found in the crypt it is possible to cauterise the edges of the crypt, to open and drain, without trying to do an extracapsular, or intracapsular or any other kind of an operation for tonsillectomy. Some of these cases are inoperable, and it is far better to

give good drainage and to remove the possibility of infection. I think that can be done in a great many cases, and radical surgery thus be avoided.

DR. WILLIAM E. CASSELBERRY: I cannot say that I feel thoroughly in sympathy with the point of view presented. It goes without saying that we should not remove tonsils which we are sure are healthy and which will not give rise to systemic infection. It goes equally without saying that we should remove those which are harmful. I am unable to assure the internist that the tonsils are not the source of systemic infection, even after I have evulsed the pillars and have explored every repository of infection, because the tonsil is a sponge, and may be still the source of infection after such exploration. Many times when the internist sends us a patient for examination of the tonsil, and we find no infection there, we should look elsewhere for the source of the trouble: we should look above. There are ten cavities just above. Sinus suppuration is exceedingly common, and is not infrequently the primary source of infection in the tonsil itself. If we remove the tonsil we are still not sure that we have removed the source of infection. Our duty to the internist is to find the source of infection if it is not in the tonsil.

DR. THOMAS HUBBARD: Dr. Casselberry's remarks about finding the source of infection applies to the teeth. Given a case of some form of systemic infection, probably of focal origin, it will be our first duty to prove that the tonsil is or is not diseased, and then to find the real source. The method followed is extremely interesting. Dr. Price of Cleveland is able to study the condition of the peridental tissues, and, by culture of the various bacteria obtained, to tell the influence upon the system. In this way he has been able to exclude certain teeth and to find the diseased root which is the source of the active organism. In doubtful cases, where there is objection to operation, we should be able, by some such method, to tell whether the tonsil is the source of infection.

DR. HANAU W. LOEB: It is easy enough to exclude the teeth, or pyorrhea, or a small abscess at the roots; but it is not easy to tell when the tonsil is at fault. In a case of rheumatoid arthritis, getting worse for one, two, or three years, in which repeated examination revealed nothing and in which the tonsils are not specially large, would you leave those tonsils? I have recently had such a case of rheumatoid arthritis, examined by various internists without result. I removed the tonsils, made a vaccine after the method of Rosenau, used it, and the patient got better immediately. Because the danger of increasing the pathologic process by a single attack of mild tonsillitis is so great, I think we are justified in removing the tonsils, providing, of course, the age and the general condition of the patient permit. While we should not remove tonsils indiscriminately, in the presence of disease which cannot be otherwise located we are justified in removing them. The appendix and the tonsil are very closely related as to structure. The fact that removal of the appendix was followed by cure of the rheumatoid arthritis does not necessarily mean that the tonsils should not be removed.

DR. JAMES E. LOGAN: Nothing has been said of one source of infection which to my mind is very important—the vault of the pharynx. I think many infections come from failure to appreciate a condition in the vault of the pharynx which is there by reason of neglect of inflamed or degenerated adenoid tissue, possibly a constant source of irritation. If we will clear out these vaults, clean out this adenomatous, fibroid or lymphoid tissue, we will get rid of many cases of systemic infection.

DR. GEORGE E. SHAMBAUGH: The word indiscriminate would exclude

all discussion, because no one believes in removing tonsils indiscriminately. However, the whole subject of removing tonsils for systemic infection is very important. The question of focal infection in systemic disease is much better appreciated by internists than by specialists. One of the most important chapters in medicine is the relationship of focal infection to systemic disease. Not only these rheumatic conditions, but Bright's disease, chronic neuritis, enlargement of the thyroid, appendicitis, have been traced definitely to tonsillar infection. At the Presbyterian Hospital, in Chicago, where most of this work has been done, it has been found that there is a distinct relationship between appendicitis and tonsillitis. Duodenal ulcer, also, often results from focal infection. It is not always the tonsil, however, that is the source of the focal infection. Pus taken from focal infection anywhere else, injected into a guinea pig, will produce gastric ulcer. The infection is produced through some selective action. We are now merely on the threshold of this entire subject. These questions should not be worked out in an isolated way, by dentist, by nose and throat specialists, or others, but by all together.

The question is, how accurately can we tell when the tonsil is at fault? My opinion is that in most cases we can tell pretty accurately. One way of telling is by the history. If a patient has had an attack of rheumatism following an attack of tonsillitis, there is good reason to believe there is an association between the two. I would not take the risk of another attack of tonsillitis in a case of endocarditis. Many patients deny having had sore throat, and in many cases it is possible to find pus in the tonsils of patients who have never had tonsillitis. If we are not able to demonstrate any positive evidence of the tonsil being the source of infection, can we exclude the possibility of its being so? Before removing the tonsils in such cases I want a capable internist to go over the case; if he cannot find any focus, the tonsil is the most suspicious source. I may cite an illustrative case. A woman, of perhaps fifty years of age, consulted me two and a half years ago, saying, "I have neuritis in my right arm; I want you to take my tonsils out." I asked her why she thought she had tonsillitis. "Some of my neighbours," she said, "have rheumatism, have had their tonsils taken out, and are better." She was under the care of Dr. Billings, and I sent her back to him. She came back after a week, saying he said, "Take the tonsils out." I could express nothing from the tonsils. In removing one of the tonsils I opened an abscess. The patient got well of the neuritis. Another case in point was that of a physician who had had rheumatic fever for several years, an attack every year. He had had five attacks of tonsillitis. The internist could find no other source of infection. The man was seventy-one years old, and did not want to have his tonsils removed. He continued to have the attacks of rheumatic fever. I finally took out his tonsils but he was not improved. It was then found out that he had a urethral abscess: treatment of this cured the rheumatism.

Dr. OTTO T. FREER: Why should the internist be the one to make these examinations? He can examine the chest, the abdomen, etc., but he is not the one to examine the nostrils. There has been a slaughter of the innocent in this matter, with the general practitioner taking out tonsils. I agree that the tonsil is apt to be the source of infection, but the pharyngeal tonsil, as Dr. Logan has said, is more often the source of the trouble than the faucial tonsil. The lymphatics usually tell the story of focal infection. If I find no lymphatics involved, I am not inclined to consider the tonsil the cause of the infection.

Dr. SHAMBAUGH: The internist is the one to help the patient to get

the problem threshed out. Glandular infection has nothing to do with systemic infection.

Dr. GREENFIELD SLUDER: It seems to me that there are two problems the solution of which will eventually clear up the question: first, the physiology of the tonsil; second, the perfection of Dr. French's work. The tonsil takes up what is put upon its surface very readily; this is quickly absorbed, and is thrown into the system beyond the tonsil.

Dr. RICHARDSON, closing the discussion: After giving the title of this paper to the secretary last winter I was sorry several times that I had done so, because the more I thought of it the more I realised how difficult it would be to discuss the subject without incurring the ill-will of one faction or another. Dr. Casselbury agreed with me most thoroughly, without intending to do so. I am glad that Dr. French's work bids fair to solve the problem. Dr. Shambaugh has emphasised one point that I tried to bring out—that there are other points of focal infection besides the tonsil. It is our duty to be able to elicit these for the internist. Dr. Logan has called attention to the fact that there may be crypts in the pharyngeal tonsil which are as much diseased as the crypts in the faucial tonsil, and which are as apt to cause systemic infection. I recall a case, sent me by an internist, in which the patient asked me to look in her right ear. I did so, and found a chronic suppuration, which she said began when she was fourteen years old, following scarlet fever. She was then twenty-six. She had beginning rheumatoid arthritis. I did a radical operation on the ear, but did not touch the tonsils. She is well and working. We must conscientiously go into these cases, examine the ears, the sinuses, the vault of the pharynx, the teeth, and note whether these will help us in the study. It is not only rheumatoid arthritis, but all the other forms of infection, that may be due to these focal lesions. In cases which cannot be made out thoroughly, even if the tonsils do seem to be infected, one must be on the look out for syphilis and latent tuberculosis.

Effects of Protein Extracts from Fruits and Pollen on the Upper Air Tract.—Walter F. Chappell (New York City).—The writer has recognised for some years that some people suffered from a variety of local irritations of the mucous membrane of the upper air tract and external auditory canal, which were attributable to eating certain fruits or drinking certain wines.

In the early summer cases of pharyngitis and laryngitis were classed as strawberry throats; in the autumn as cider and grape throats, and an occasional tomato throat. In addition, pain, tenderness, and swelling of the external auditory canal were traceable to eating apples and drinking cider. Occasionally an acute sneezing, accompanied by discharge and swelling of the mucous membrane of the nasal passages, followed eating quantities of grapes or drinking claret or similar red wines. In a few instances these symptoms were attended by swelling and burning sensations of the tongue and lips. There are children who have stuffy noses, constant colds, pharyngitis, and croup, due to the nature of the food they take. Raw apples cause the greatest trouble, but when one is anaphylactic to one fruit he may be to several others. Cooking these fruits greatly modifies their effect, but even then, if taken in large quantities and continued for some time, they still produce irritations of a milder degree. Believing that the protein extracts of fruits might be the cause of these conditions, protein extracts of apple, strawberry, grape fruit, and tomato

were made for the writer, and applied to five people known to be anaphylactic to apples, strawberries, and to tomatoes, while a sixth person was used as control. Terrific reaction followed the injection of one minim subcutaneously of apple protein extract of a 1 to 60,000 strength, with a drop on a small abraded surface. Local reaction occurred only in the second case, as also in the third case. Severe reaction followed the local application of the strawberry protein in the fourth case, and only some redness followed the intracutaneous injection of the tomato extract in the fifth case. In hay fever cases the writer has seen much benefit follow the internal administration of cinchonidia sulphat, but he has seen no permanent cures following this treatment.

Pollen Therapy in Hay Fever.—J. L. Goodale.—Methods of gathering plant pollens are discussed. A 14 per cent. solution of alcohol was found to preserve the pollen extract for several months. When hay fever patients receive an application of the exciting pollen to a scratch of the skin, a definite reaction occurs, consisting of oedema, hyperemia, and itching. The application of this test enables us to determine the special causative plants for each case. The intensity of these skin manifestations may be sensibly diminished by the repeated parenteral administration of the proteids in question. Coincident with the diminution in skin reaction there seems to occur an increased tolerance of the exposed mucous membrane to the pollens of the plants employed. Pollen therapy in hay fever may be regarded at the present time as a promising method of treatment, but its value and the permanence of its results remain still to be definitely established. Serobiologic methods have shown the phylogenetic relationship of the different plant orders and families. The application of these discoveries to the treatment of hay fever by injection of plant proteids promises to assist in the selection of the specific material required for a given case.

Dr. BURT R. SHURLEY: I have been extremely interested in the working out of the question of sensitisation to the pollens of ragweed and goldenrod, which are the only pollens I have been able to secure. The whole question of anaphylaxis and sensitisation has been explained by Vaughan, of Ann Arbor, by the splitting of the proteids and the elaboration of toxins, ptomaine, and leucomains. His theory is very rational. He has shown that egg-white will kill a guinea-pig in a short time. A toxic dose after the ninth day is fatal. A number of Dr. Goodale's observations I have been able to confirm as I have worked along. If the dosage is run too high the depression is great, resulting, perhaps, from the exhilaration of the toxin. One laboratory has turned out, from the clinical standpoint, practically all the pollen toxins which can be used in hay fever. Fifteen doses, in ascending scale, may be found in the market. The clinical value of this I do not know, but it is claimed that 50 per cent. of hay fever patients are absolutely protected during the hay fever season.

Dr. EMIL MAYER: The question of standardisation is very important. Standard solutions, not stock solutions, should be employed. Standardisation can be done and must be done, just as is the case with the pharmacopœia, in which a fluid extract represents so many grains. For this reason I resent the rushing in of a chemical firm and the presenting of a stock pollen. The work presented to-day is very gratifying.

Dr. HARMON SMITH: The first patient mentioned by Dr. Chappell was a patient of mine, suffering from what I thought was eczema of the external ear, of uric acid origin. Since he was under my care he went to

Dr. Chappell. He was a large man, of fine physical physique, weighing over 180 lb., and not at all neurotic. When I saw him he had a large welt on the arm, extending around about two-thirds of the arm. He was very sick, giving every evidence of great physical depression. The doctor mentioned in this paper I also knew very well. His reaction from the strawberry, I am sure, was produced absolutely by the protein in the fruit.

Dr. MAX A. GOLDSTEIN: These reports convince us that we have been working in the dark for the last few years. Animal proteids, vegetable proteids, and the whole series and ramifications of proteid substances and their anaphylactic reactions will have to be reduced to a system before any practical clinical work will be accomplished in hay fever. Standardisation is necessary for practical purposes. Unless we can reach a more definite and limited basis we will never see the end of this tremendous field. I have in mind the wife of a physician, an internist of standing, who has used calcium salts for the second season, with no practical results as yet.

Dr. GOODALE, closing the discussion: I wish to express my disapproval of the procedure which has been brought forward by the chemical firm, of what might be called a shotgun prescription for hay fever. As I understand it, it is to be used in the majority of cases of hay fever. It is possible that in a patient with one sensitisation, by injecting this stock product another sensitisation may be given.

Fluoroscopic Bronchoscopy (Supplemental Report).—E. Fletcher Ingals.—The fluoroscope is of much value in the hands of the well qualified bronchoscopist. Its use will lessen the danger and decrease the number of failures where its use is indicated. It is of especial value where there is so much mucus, pus, or blood that it is very difficult or impossible to see the foreign body, or where granulation tissue covers the foreign body; where there is an abscess cavity in which the foreign body is hidden; where a stricture has formed, and in difficult cases in which the body is lodged in a bronchus going to the upper lobe of the lung, or in any bronchus where it cannot be exposed by the ordinary methods. It is better not to use any anæsthetic, and a narrow, strong forceps that will hold is especially important. The surgeon, standing at the left side of the patient's head and holding the bronchoscope, which was previously introduced, to the foreign body, directs it by the shadow to the foreign body. The forceps is guided to the foreign body by the shadow, and the blades are opened and the forceps passed a little further so as to grasp the foreign body. Considerable traction may be required to draw the body through the stricture. Two cases are reported to further illustrate the utility of the method.

Foreign Body in the Lung, the Primary Diagnosis of which was made by a Blood Examination—Removal; Recovery—George L. Richards.—Male, aged twenty five, had occasional attacks of asthmatic breathing, bronchitis and chills from some time in early childhood. It struck the writer as being peculiar that a young man should have occasional attacks of chest pain, occasional attacks of chills and fever of very short duration, with only a suggestion of a cough, but with a moderate, steady leucocytosis and with no definite physical signs. It suddenly dawned on the writer that these symptoms were suggestive of a foreign body in the bronchus, and that all the symptoms might be thus occa-

sioned. A Roentgen examination disclosed a tack in the right bronchus. There is no history as to when the tack entered the lung. Dr. Chevalier Jackson, after administration of morphin and atropin under cocaine anæsthesia and with the aid of the upper lobe bronchus forceps, after dilatation of the strictured bronchus, removed the head of the tack; the point was not forthcoming. The head was much eroded and oxidised. At no time could the tack be seen by direct inspection. No reaction followed, and no chill or other further trouble with the lung has occurred since. Foreign bodies which have been in the lung a long time and are unsuspected are probably far more common than any of us have yet ascertained.

Dr. ROBERT CLYDE LYNCH: I have here one of the first changes made in the Killian suspension apparatus. It allows for the movement of the horizontal tooth plate about an inch instead of a quarter of an inch, as with the Killian model. One of the great disadvantages of this was that the platform projected into the mouth, interfering with the view. In order to get rid of these disadvantages I constructed an apparatus which has a vertical movement. It allows the opening of the mouth, with nothing to obstruct the view. The principle was found to be entirely wrong; in other words, the centre of gravity was found to be to the side of the middle, and the head would pull over to one side. This is shown merely as one of the mistakes made in the development of my apparatus. The last improvement so far has served very well under all circumstances to which it has been applied. Most of my dissection work has been done in adults, who require more motion than children. It must be made flexible, and must have motion in excess of what is usually necessary. First of all, the base which supports the tongue spatula is extremely heavy and will not bend under any circumstances. I have suspended patients weighing as much as two hundred and fifty pounds. Again it will open the vertical direction two inches, which is in excess of that given by other methods. It has another motion not obtained before. It also has a separable tooth plate. I now use two tooth plates, which will fit on in this fashion (demonstrating). This has the advantage of giving two points of fixation as against one. When the upper jaw is fixed against these two points it is prevented from moving from side to side. The double ring keeps the instrument in the centre of gravity. In some cases where the patient is under suspension this screw will jam. In order to prevent that I have had a nut drilled and have a little handle which can be used to jack it up, just as you would use an automobile jack. The spatula, which has given a good deal of trouble in keeping the tongue in shape, is constructed in my apparatus much on the pattern of the last Killian model. The wings are flexible; with it the sides of the tongue can be lifted up and kept flat. The handle, in other models, was hard to sterilise, so I have constructed one which is made of hard steel, so that it will not bend under the most trying circumstances. It is rough on the back, so that it will not slip. The point tips up a little, the wings are fixed. It shows the anterior commissure much better than is possible with the older models. The instrument is introduced closed.

Dr. HARMON SMITH: Dr. Ingals' method of locating and extracting foreign bodies recalls an unfortunate case which I saw in consultation. The patient, a man, had inhaled a hand dental bur, which consisted of an aluminum handle and bur. The dentist had dropped this instrument on the patient's tongue, turned around to take up another instrument, and during this time the man inhaled the bur. He was advised to have an X-ray taken. He went to a business meeting down town, and afterwards had the X-ray taken. This showed the foreign body in the

left upper lobe bronchus, high up. He then consulted an expert bronchoscopist, who worked an hour trying to extract the body. He failed. I was then consulted. I worked at it, but could not get into the bronchus. Another laryngologist was called in, who has extracted foreign bodies under similar circumstances, but could not extract this one. Dr. Jackson was telegraphed for, and came bringing his own instruments and assistants. He work an hour or more, but was defeated. It then became necessary to remove a part of the man's lung. He was an old man, and died subsequently from the shock. It was impossible to turn the corner to get the foreign body in the ascending bronchus of the left lobe.

Dr. THOMAS HUBBARD: Dr. Ingals' remarks with reference to the liability of the indiscriminate application of the fluoroscopic method of examination are very timely. In a case recently under my observation the method was tried in removing a tack from the right lung. The tube was passed far enough down to reach the tack and turn it over. A skilful fluoroscopist was assisting, the operation was prolonged for some time, and every effort made to extract the tack, but it was impacted by the method. It had been turned crosswise and had to be straightened out by a hook. There is always danger to the fluoroscopist in these prolonged operations. The man whom I had has already lost one finger from epithelioma. There is also danger to the patient. Sometimes foreign bodies become encysted. I recall a case in which a boy swallowed a nail. Several good diagnosticians went over him very carefully, but could not locate the nail. It was finally located by means of the X-ray, and proved to be an eight-penny nail, which was encysted. There were no symptoms from this foreign body. If the patient is conscious, he will often aid in telling whether we have got the foreign body. The finger-thumb action of the forceps is more delicate and positive than the grip with the hand. The action of the the Ingals forceps is too stiff.

Dr. JOHN F. BARNHILL: I would like to ask Dr. Ingals to state his method of watching the end of the fluoroscopic forceps—whether an assistant, the fluoroscopist, or he himself watches the end of the instrument; also whether there is any danger of grasping the lung in getting through a spot where there is an abscess. In the lay press, in all accounts of foreign bodies getting into the lung, the writer always says the patient swallowed a foreign body. Dr. Richards used the same term in his paper. Is it not aspirated or inspired?

Dr. WILLIAM E. CASSELBERRY: I would like to ask Dr. Ingals the arrangement of the table, and whether a specially constructed table is required; also whether the fluoroscope as ordinarily used is adaptable for the purpose.

Dr. ROBERT CLYDE LYNCH: I recall a case in which a nail was in the lower lobe bronchus. I had made a canvas cot, on a trellis, and put the X-ray tube under this, I directed the forceps from two points of view. To be sure I was in the line of the right bronchus, after getting the tube so that it actually touched the nail, the patient was swung over on his side, and an anterolateral view obtained. The nail was extracted without difficulty.

Dr. INGALS (closing the discussion): Dr. Richards spoke of the tack itself coming away piecemeal, or having been oxidized. I had an experience with a much larger nail which had been in a boy's lung for eight years. It appeared two or three times larger than it was. I got nothing but the head; the rest came up as a lot of black fluid. I watch the forceps myself. In operating from the head of the patient I can look

over and see. You cannot do this with someone to direct you how to move it. It is on account of puncturing the lung that I caution gentleness. If you use enough force you can easily puncture the lung, but it is not at all necessary. I understand perfectly the danger of prolonged fluoroscopy, and that is why I said one should always have an expert fluoroscopist. The light should not be turned on more than a half minute at a time. The operation should certainly not be prolonged excessively. I used specially arranged tables so that the light can be placed wherever I want it. Sometimes it is necessary to have a simple board made which raises the ordinary table found in the hospitals. This method should not be employed whenever a patient has a foreign body in the lungs; it should be the last resort. The foreign body should be found and removed by other methods, if possible. When the operation can be done under inspection it is much better. Where there is a stricture which is difficult to dilate, this may fail. Dilatation of a stricture is difficult. It may not be necessary, as it will sometimes dilate as you work if you can get the forceps through. It would not take more than two or three minutes to get through a stricture. When the foreign body is high up in the lung it is difficult to see it. That can be helped a good deal by position. If the patient's head is turned to the side and the direct bronchoscope toward the middle, you can see the upper branch of the bronchus.

Dr. RICHARDS (closing the discussion): The question arises in connection with these foreign bodies, how long and how much we are justified in searching for them? Dr. Smith's case calls to mind a case in which an attempt was made to remove a small gold pin of the safety pin variety. The patient was a young woman. Killian, before a committee of medical men, worked for an hour or more and failed. Later in the same summer Dr. Jackson tried to remove the same gold pin at the Rhode Island Hospital. He worked about an hour and a half, and gave it up. The girl went into the hospital as a patient, remained as a pupil nurse, has been there for two and a half years, and has never had any pain from that pin. It is a question sometimes whether we should not wait for more definite symptomatology. I think in Dr. Smith's case if they had waited the man might be alive to-day.

Dr. SMITH (continuing the discussion): It was advised to wait in the case which I mentioned. The majority of the consultants wanted to wait, but Dr. Jackson said pneumonia might result. The matter was put up to the family, and they said operate by all means. The man was in such a nervous state it was thought he would die anyway. The head was bent over as far as the man's neck would allow, and it was determined that tracheotomy would offer no further aid. Dr. Jackson had recently read a paper in Brooklyn on the limitations of bronchoscopy. One week previous to that he had used similar instruments and had removed successfully a body which had gone down to the lower instead of the upper bronchus.

Dr. INGALS (continuing the discussion): As to the duration of the operation, one might well adopt the rule that one hour should be the limit. Ordinarily a half hour is sufficient. If the patient is in good condition one may keep on for an hour, and then try again some other day. It is better to let the patient live with the foreign body in than to keep on too long. Many patients live for eight or ten years with foreign bodies in their lungs. It is better to wait and give the patient a chance. The probabilities are that a foreign body in the upper lobe will settle down to where it can be more easily reached.

The Sympathetic Syndrome of Sphenopalatine (Nasal) Ganglion Neurosis, Together With a Consideration of the Neuralgia Syndrome, and Their Treatment.—Greenfield Sluder.—Dr. Sluder reviewed his observations on the nasal ganglion which were summarised in his text "Etiology, Diagnosis, Prognosis and treatment of Sphenopalatine Ganglion Neuralgia" (Transactions, Section Oto-Laryngology, American Medical Association, 1913). One point only was added to this text, namely, the very great difficulty incurred sometimes in effecting a cure of that neuralgia is explained by the fact that hyperplastic sphenoiditis underlies the disorder and may frequently be overlooked because the picture in the nose is not very striking, and that the pain is very much of the time a pure ganglionic neuralgia. Such cases require careful selection to decide whether they be injected or take the Hajek postethmoidal radical operation. To the already described picture he added the "Sympathetic Syndrome," which in its fullest development is characterised by great sneezing, watery discharge and swelling of the nose within and without (rosacea), with profuse lacrimation, reddening and swelling of the lids, dilatation of the pupils with the appearance of slight exophthalmos (staring), a sense of itching and burning, or a feeling of wind blowing into them, together with a peculiar sense of discomfort, which seems independent of secretions or congestion; and more or less photophobia, sometimes very great. In addition to these symptoms, there is sometimes dyspnea with dry râles. He found that cocaineisation of the nasal ganglion relieved this symptom complex. He observed furthermore that it was often subdivided, sometimes being merely the sneezing, sometimes red nose (rosacea), sometimes secretions, lacrimation, and photophobia. He stated that many of the ordinary coryzas are of this type, which of course are to be differentiated from affections of the membrane leading to suppurations of the sinus. He recommended the same treatment as previously given for the neuralgia syndrome. He offered a probable explanation based on anatomic and physiologic facts. Anatomically, the fibres of the cervical sympathetic from the nasal ganglion pass downward by way of the Vidian and carotid plexus to the cervical nerves and to the lower cervical ganglion, which is often fused with the first thoracic. These ganglia are anatomically allied to the nerves which, in addition to supplying the neck, also make up the brachial plexus and supply the upper extremity. Accelerator fibres for the heart and vasomotor fibres for the lung also pass through these ganglia. He felt that it was a lesion of the sympathetic elements of the nasal ganglion which explains not only these vasomotor secretory phenomena, but also the pain referred into the neck, shoulders, arm, etc., as Vidian neuralgia, and that it came to pass by virtue of the sympathetic fibres which arborize about the cells of the spinal ganglia of the nerves which make the supply of the neck and upper extremity. He also offered as explanation of nasal asthma the fact that accelerator fibres for the heart and vasomotor fibres for the lungs pass through the lower cervical and first thoracic ganglia, through which also pass the cervical sympathetic fibres, and suggested that the pain of angina pectoris might be explained by sympathetic impulses arising in the heart passing upwards through the above mentioned ganglia, which are in association with the brachial plexus. He found that the pain of glaucoma, iritis, corneal ulcer, keratitis, and conjunctivitis was controlled by anaesthesia of the nasal ganglion, and that it was a nerve blocking process. He thought that it was the sympathetic that transmitted the "heavy pain" from these lesions which went into the occiput and the neck, and found that the course of some of these

diseases was benefited by the control of the pain, and wondered if some tropic influence were not also exerted through these paths. He had at times succeeded in stopping the râles by cocaineisation of the nasal ganglion on the same side on which the nasal ganglion was cocaineised in some cases of asthma of not too great severity.

Dr. HARRIS P. MOSHER: I think Dr. Sluder will remember that in a conversation some years ago I made the remark that somebody, some day, would do something with Meckel's ganglion, and straighten us out about hay fever. I have been waiting for someone to do this. Dr. Sluder has done it, and I congratulate him upon that achievement. Two years ago Dr. Mathews, of the Mayo Clinic, came to Boston and said he had been having great success in curing headache due to closure of the frontal ostium, and had cured hay fever by the cauterisation of the two sides of the middle turbinal. I doubted that this was as he said it was; I did not adopt the procedure. He came back to Boston and I asked him about it; he said he had been curing frontal headache, asthma, and hay fever. After two years of knowledge of that procedure I began to try it in the clinic at the Massachusetts General Hospital. Cauterisation of the outer and inner surfaces of the middle, followed by the application of adrenalin, was successful. I could not see then how it worked; I do see now, thanks to Dr. Sluder.

Dr. SLUDER, closing the discussion: Answering the question asked by Dr. Freer, as to where I make the injection in order to get at the nasal ganglion: The sphenopalatine foramen is situated immediately posterior to the posterior tip of the middle turbinal, and absolutely never varies. It is at that point that I make the application. In this kind of cocaineisation I prefer to take the slightly curved applicator and curl around. For total cocaineisation of the ganglion I prefer to slip the applicator under the point and approach it thus. It takes a tiny bit of cocain, and the applicator under the turbinate can be left in place. For operative purposes I leave it under the tip. For the sympathetic acute syndrome I simply paint it, and paint again if necessary. It is astonishing to see the effect of the cocain. I use a saturated solution of cocain, by preference the large crystals. The large crystal is freer from poison than the rest. A poison is left in the mother liquor. The small crystals come out first and then the big ones, which are freer from poison. The ganglion is almost submucous in many skulls. With the Holmes pharyngoscope I can see how I am going. I prefer a straight needle under the tip.

Report of Progress of a Case of Pituitary Tumour Reported in 1914.—T. H. Halsted.—At the last meeting of this society I reported a case of cyst of the hypophysis occurring in an Italian girl, nine years of age, upon whom I operated, following the method of Hirsch, doing the operation in three stages under cocain anaesthesia. This child came under my observation for the first time on February 6, 1914, fifteen months ago, at which time she presented briefly the following symptoms: She was very large for her age, marked and increasing adiposity; skin was dry and harsh; hair dry and coarse, growing low on the forehead; eyes large, pupils dilated; marked general ataxia with intention tremor, choreiform movements; well marked athetosis; paralysis of the pupil; deep and superficial reflexes not altered. There was extreme difficulty in making coordinated movements, gait was unsteady, complained of frequent dizzy spells, headaches were very severe nearly every other night, and the sight was decidedly impaired. She was unusually bright mentally. An X-ray showed the sella turcica to be somewhat larger,

than the average normal at this age, while above and posterior to the sella the brain area was of lessened density. All the operative work was under five per cent cocaine with 1-2000 adrenalin, and was done in three stages, the last stage consisting in incising the tumour, which proved to be a cyst, liberating about one half-an ounce of clear, limpid straw coloured fluid, and was followed by quite a decided change in the symptoms.

The child recovered from these operations, finally being taken to her home in a neighbouring village three months after the last operation, on the whole not improved by her surgical experience, the cyst having evidently refilled. The parents declined further operation, and I have seen her only two or three times, as I have gone out to see her at her home. Pituitrin was given her for several months, but for six months she has been without it. Her present condition is as follows: Child is now ten years of age and is confined constantly to bed. Muscular weakness is so great that she cannot walk unaided, and to assume the upright position must be literally held or propped up. She can sit up in an arm chair or rocker with arm and head supports. There has been an enormous increase in adiposity, the fat being distributed throughout the body, while her head has increased to a size that for her age is almost huge. Comparing the measurements of her head with that of two sisters one a year older and one a year younger, it is found that the measurement of the circumference on a level with the parietal eminences is in the older child twenty-one inches, the younger, twenty and three-fifths inches, while the patient's head measures twenty-five inches. The vertical measurement of the circumference under the chin, back of the ears, taking in the parietal eminences, is for the older child twenty-three inches, the younger, twenty-three and one-half inches, while the patient's measurement is twenty-six and one-half inches in this circumference. While the patient's head was larger than normal at the time of operations fifteen months ago, the increase in size since that time has been most striking. The colour of the hair is a very dark brown, it has not increased in coarseness, and the tendency to become reddish, as a year ago, has ceased. There is a marked tendency to somnolence most of the time, the child sleeping a great deal during the day as well as night, although for some days and for a week or two at a time this may not be the case. She is unable to feed herself because of the incoordinated movements and the lack of muscular strength. Intention tremor is very marked. She cannot wipe her face because of the tremor nor approximate the finger tips; on attempting to stand alone the foot is drawn inward and upward, in the position the foot would assume in standing on the outside of the foot. She is unable to hold her head up unaided, apparently due to lack of muscular strength. The cranial nerves are apparently normal excepting the optic. Reaction to light is much impaired. Pupils are not widely dilated. She can distinguish fingers at six feet. The motor nerves all functionate, but are weak. She can distinguish heat and cold. Reflexes are exaggerated. Babinski is marked. There is apparently no great increase in the amount of urine, though it is frequently passed involuntarily. Stools the same. Speech is difficult and thick. Memory does not appear to be very greatly impaired. For instance, she asked by name after many of the patients and nurses she had not seen in fifteen months. On examination of the nose it is found that the base of the sella, covered by the mucous membrane, is freely seen, the anterior wall of the sphenoid being absent. It would be a very simple matter to reincise the tumour if the parents.

consent were granted, or if it seemed advisable to do so. I have not urged an operation because of the almost certainty that the cyst would soon fill. The accompanying photograph gives a very clear picture of the child's general appearance.

Dr. JOHN F. BARNHILL: I have employed the Cushing method, using the Cushing retractors. After the parts are dilated the septum can be taken away for the purpose of getting at the anterior wall of the sphenoidal sinus. After that the nose can be dilated as much as needed. This gives a clear-cut view of the field. The Cushing retractor and dilator are absolutely necessary. The speculum itself is built very much like the old Marion Sims bivalve speculum. The operator is not hindered by any hands being in the way. The method is very commendable.

Dr. HALSTED: I have never seen the Cushing operation, so I cannot compare the two. The method which I employed involves a little operation which West originally did, and to which Coffin called attention—that is, doing the submucous and going on up to the rostrum of the sphenoid. In the second operation the posterior end of the septum was taken off completely, mucous membrane and all. That gave a tremendous field. The advantage of this method over Cushing's is that it can be done under local anæsthesia, in two or three stages, and one gets as good view as is necessary.

Tumour of the Pharynx Eventually Terminating in Sarcoma.

—Ralph Butler—A healthy married woman aged twenty-one developed a series of pharyngeal tumours which were apparently cured four times in the course of two years. The first attack yielded to inunctions and protiodid of mercury. An almost fatal attack was relieved by iodide of potassium, mercury and neosalvarsan. In two other recurrences, the X-ray treatment was used in addition to the mercury, iodide of potassium and neosalvarsan. The Wassermann reaction was weakly positive at first, and the luetin reaction was positive. The first microscopic examination suggested syphilis, the second, small round-cell sarcoma. The autopsy showed small round-cell sarcoma with beginning metastasis.

Dr. GEORGE L. RICHARDS: A certain number of sarcomas of the upper air tract seem to spontaneously disappear, or to be influenced by remedies which one hardly seems to think would have any curative effect. I recall a case of sarcoma of the right upper jaw, in a woman aged fifty to fifty-five, a boarding-house keeper. The diagnosis of sarcoma of the antrum was made by a laryngologist of ability, and this was confirmed by general surgeons. She was being treated with Coley's fluid when she fell into the hands of a Christian Science healer, and the tumour disappeared. I have seen her four or five times in association with a general surgeon. I have tried to get the opportunity of examining her again, but she is still under the control of the Christian Science healer.

Dr. G. HUDSON MATTEN: I had the privilege of seeing the patient mentioned by Dr. Butler during the interval of the fourth time that she appeared to be cured. I think no one who was present at that meeting thought of the probability of a return of the trouble. She had nothing in the throat except a considerable amount of scar tissue and the cicatricial contractions, as described by Dr Butler. Her breathing and arti-

ulation were fairly good. It was a surprise to us all when he reported her death at the following meeting.

Dr. GEORGE A. LELAND: I was called last winter to see an old lady, aged seventy-three, who had enlarged glands in the neck. I made the diagnosis of lymphosarcoma. She was put under treatment with Coley's fluid, and he writes me that the tumour has entirely disappeared.

Dr. HARMON SMITH: We should not depreciate the benefits of Coley's fluid. I recall a case of sarcoma of the antrum occupying the entire nasal cavity and projecting outward. There was lymphatic involvement and the case seemed hopeless. It was pronounced sarcoma by the pathologists. I said the only thing we could do was to operate, and that if he died on the table it would be the most satisfactory termination of the case. The patient went to the General Memorial Hospital, was put under treatment with Coley's fluid, and the sarcoma entirely disappeared.

Dr. HENRY L. SWAIN (New Haven): Whether the disappearance of these tumours is due to tumour transformation, as has been suggested, or to the agents employed, the fact is that we stand with reference to them in the position of strict empiricism. This applies to Coley's fluid as much as to anything else. If we could collect all the observations on the subject, we might then have something to go by; until that is done its use will always be empirical. I have two cases in which it seemed to do good, and many others in which it accomplished nothing.

Abstracts.

PHARYNX.

Davis, E. D. D.—Ulceration of the Soft Palate. "Proceedings of Royal Society of Medicine." Section for the Study of Disease in Children, June, 1916, p. 79.

The case shown was that of a girl aged thirteen. She had a large irregular ulcer involving the left half of the uvula, soft palate, and left pillar of the fauces, with considerable loss of the left half of the palate. The ulceration was a typical of lupus, tubercle, or syphilis. There was no other lesion of the nose, pharynx, larynx, or ear.

The Wassermann test yielded a positive reaction. There was a definite history of infection with syphilis of both parents. *Archer Ryland.*

NOSE.

Wheelock.—The Blood-clot Dressing in Operations for Simple Mastoid Abscess. "Laryngoscope," 1916, p. 93.

The paper is based on thirteen consecutive operations for simple acute mastoid abscess in which the wound was closed at the time of operation. The cases only remained seven days in hospital. Wheelock is aware that many of the best surgeons have tried the method and put it aside. The blood-clot dressing was first proposed by Sprague, of Providence, R. I.,

and first used by Blake, of Boston. Wheelock uses iodine to prepare the skin, but does not interfere at all with the hair. He insists that the operation should be a thorough one—every vestige of softened bone being removed. "We must go to the dura within and to the skin without." At the end a free incision is made in the drumhead and a gauze drain inserted. The writer claims the following advantages for the method: rapid healing, no painful dressings, no deformity, and no failures. He recalls Mygind's statement in London in 1913, that the healing of the cavity formed in the Schwartz operation generally takes from six to twelve weeks. Wheelock claims that Mygind's operation for secondary suture does not differ in any essential from the blood-clot method. From the experiments of Metchnikoff, Nuttall, Foder, Vaughan, and Novy, Wheelock concludes that the bactericidal power of drawn blood is greater than that of the blood circulating in the vessels. The germicidal power is, however, lost after forty-eight hours.

J. S. Fraser.

H. O. Reik—The Ideal Mastoid Operation. "Laryngoscope," 1919, p. 99.

Reik defines an ideal mastoidectomy as "one that submits the patient to the least additional risk, and offers the maximum assurance of cure in the shortest space of time with a minimum of deformity or scar." In the preparation of the patient Reik advises shaving the usual area, the use of soap and brush, alcohol or ether, and a moist bichloride dressing. He uses gloves and a cap and face mask. Each used instrument is washed in carbolic and then in sterile water before being replaced. The entire head and shoulders of the patient are covered by a sheet, which is carried over a metal frame on the distal side of the table so as to shut off the anaesthetist. Reik uses a Doyen burr to perforate the mastoid cortex, because there is no danger of concussion and less risk to the dura. He holds that it is scarcely possible to do too much in the way of removal of bone, though he does not remove the mastoid tip. The inner wall of the mastoid shell should be curetted as long as there is any bleeding from the bone. The majority of sinus thromboses arise because the primary operation is not sufficiently thorough, so that if there is any doubt about the bone covering the sinus the bone should be removed. The bony cavity should be washed out with sterile saline solution, and allowed to fill with blood-clot. The wound is closed with subcutaneous silver wire sutures or Michel's clamps, and covered with silver foil and dry gauze. The clamps are removed on the *second* day. If primary union occurs the patient is usually dismissed in from five to seven days, though he should be kept under observation for some time longer. If the wound breaks down Reik holds that we are no worse off than if the cavity had been packed. Reik obtains 75 per cent. of primary healings in acute cases and 50 per cent. in those associated with old chronic purulent otitis. He states that not a single instance has been recorded of any serious complication resulting from the blood-clot dressing, and maintains that the wound is always the direction of lesser resistance.

J. S. Fraser.

Taro Matsui (Japan).—The Turbinal Origin of "Bleeding Polypus" of the Nose. "Laryngoscope," 1916, p. 109.

Bleeding polypus of the septum occurs as a rule in women, and may be related to puberty and pregnancy. The condition has been classified as a fibroma, a telangiectasis, or an angioma, but these terms correspond to different stages of growth. The etiology is doubtful. Mechanical

irritation and rhinitis sicca may be concerned. Matsui records two cases in which the polypus grew out of the inferior turbinal. (1) Male, aged forty, nasal obstruction and frequent epistaxis. Right nose blocked by a dark purple strawberry-like growth on anterior and posterior rhinoscopy. The swelling was removed by the hot snare with little bleeding; no recurrence. (2) Similar. Microscopic examination showed greatly dilated vessels and many "decayed glands." Baurowicz has stated that in one case out of eight the growth takes place from the lower turbinal. Matsui says the term "bleeding polypus of the septum" should be replaced by "bleeding polypus of the nose."

J. S. Fraser.

Hays and Lewisohn.—Hæmorrhage following Posterior Tip Operation (on Inferior Turbinal). Blood Transfusion. "Laryngoscope," February, 1916.

The writers record the case of a male, aged thirty, who complained of irritation in his throat. On examination it was found that the posterior end of the left inferior turbinal was enlarged. (The patient had had tonsils removed under general anæsthesia two years before.) Local anæsthesia was now employed, and the turbinal operation was carried out without difficulty and with almost no hæmorrhage. At 4 p.m. there was profuse hæmorrhage with pallor and feeble pulse. Packing removed and nose syringed with hot saline. Bleeding stopped. On the seventh day again severe hæmorrhage: anterior and posterior nasal plugging, followed later in the day by morphia hypodermically and saline per rectum. Afterwards horse serum was injected into the gluteal region, and on the same evening the temperature rose to 104° F. On the next day pain in left ear, followed by spontaneous rupture of drumhead, and later by mastoid tenderness (pneumococcus infection): 900 c.c. of citrated blood transfused. Two days after that another profuse hæmorrhage from nose necessitated anterior nasal plugging, and a deep injection of human serum, and later a second transfusion. Again next day profuse epistaxis. Yankauer was called in and placed two sutures round the raw area and then packed the nose with gauze soaked in coagulin. There was no more bleeding, and the patient made a good recovery in spite of arthritis in the shoulder and wrist.

The writers give the following account of the technique for transfusing citrated blood: A tourniquet is applied to the donor's arm and a vein punctured with a large size cannula. While the blood is running into a glass jar it is mixed with a 2 per cent. sodium citrate solution at the rate of 1:10. For instance, if we want to transfuse 500 c.c. of blood we would mix it with 50 c.c. of the 2 per cent. citrate solution. We then introduce a cannula into the recipient's vein, and with the aid of a salvarsan flask inject the donor's blood into the recipient's vein.

J. S. Fraser.

THE LATE DR. JULES BROECKAERT.

IN the issue of the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND-OTOLOGY for October, 1916, there appeared from the pen of Sir Felix Semon an obituary notice of our distinguished Belgian colleague, Dr. Jules Broeckeaert whose untimely death in tragic circumstances we all deplore.

The tragedy is deepened by the straits in which his wife and four-

little children are left to face the dangers and inclemencies of a world at war.

That being so, a subscription list for their benefit has been opened under the auspices of the Otological and Laryngological Sections of the Royal Society of Medicine, London, a movement which merits, and we are sure will obtain, the hearty support of all oto-laryngologists not only in the British Empire, but also in the United States of America, where Broeckaert's name and scientific eminence are well known.

In the few days that have elapsed since the list was opened the following have given or promised subscriptions:

	£	s.	d.
Mr. Mark Hovell	2	2	0
Dr. Watson-Williams	5	0	0
Dr. Donelan	1	1	0
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Dr. J. L. Irwin-Moore	1	1	0
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Subscriptions may be sent to Mr. Mark Hovell (President, Laryngological Section, Royal Society of Medicine), 105, Harley Street, London, W., England, or to the Editor of the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY.

They will be acknowledged in these columns.

NOTES AND QUERIES.

SHAKESPEARE AND RHINO-LARYNGOLOGY.

The last volume of the "Transactions of the Medical Society of London" has just reached us. It is numbered xxxix, 1916. It is a goodly tome, and it is one which we are likely to keep on account of a contribution which makes the book not a dear one to those who are not Fellows of the Society even when purchased at the price of 10s. 6d. We refer to the Annual Oration by Sir StClair Thomson on "Shakespeare and Medicine," which was delivered on May 1 last, *i. e.*, the first day of the week devoted to the celebration of the Shakespeare Tercentenary. It was a happy thought which prompted the Orator to show the interest of our liberal profession in our country's greatest poet and philosopher, and it is a particular satisfaction to note that an address dealing with the whole gamut of human existence was composed and delivered by one of ourselves, for it will go far to remove the unworthy reproach of "narrow-mindedness" so often levelled at specialists.

Larger works have been written on the medical knowledge of Shakespeare but few have given us so much pleasure in reading. Many of them are a weary agglomeration of quotations, more or less connected with matters medical. In this Oration a wise selection has been made under the headings of "Shakespeare as a Medical Seer"; "Medicine in the 16th Century"; "the Physicians in the Plays"; "Quacks"; "Shakespeare's General Medical Knowledge"; "Shakespeare's Medicine of the Period"; "His Medical Knowledge of some particular subjects (Consumption, Fresh Air, Syphilis, Cancer, Obstetrics, Public Health,

Mental Diseases, Epilepsy, Surgery and Vivisection") and "His views on Sympathy, Hope and Prognosis, Mirth and Distraction, Alcohol and Abstinence, Tobacco and Sleep, Old Age and Death." This very list shows how "myriad-minded" was the poet, and it is no wonder that the Orator calls him "one of the masters of medicine."

Sir Sidney Lee, one of the greatest authorities on Shakespeare, in proposing a vote of thanks, said that the address was "eloquent and humorous and illuminating, charmingly delivered and charmingly composed." It must therefore appeal to all medical men, and our own readers will be particularly interested in the following quotations which refer to the throat and nose. On page 284 we read:

"The Voice.—Appreciation of sweet voices, both male and female, is thus expressed:

"I thank you for your voices—thank you—
Your most sweet voices.

Coriolanus, ii, 3.

"Her voice was ever soft,
Gentle and low, an excellent thing in woman.

King Lear. . .

"The breaking of the voice at puberty is described:

"And speak between the change of man and boy
With a reed voice.

Merchant of Venice, ii, 4.

"The change of the voice in those who have been subjected to castration is thus referred to:

"My throat of war be turn'd,
Which quired with my drum, into a pipe
Small as a eunneh, or the virgin voice
That babies lulls asleep!"

Coriolanus, iii, 2.

Personally, I have taken great interest in what I thought was the discovery of a reference to singer's nodules in the line:

"For my voice I have lost with hallowing and singing of anthems."

Henry IV, Part II, i, 2.

But when I discovered that the confession emanated from Sir John Falstaff, and realised—as we shall hear from his own lips later on—that he was addicted to indulgence in wine and had been exposed to syphilitic infection, then I felt that the loss of voice was not entirely due to anthem singing, but was more likely the result of tertiary laryngeal syphilis in an alcoholic subject!

"The description of the thin voice of old age is well known:

"His big manly voice,
"Turning again towards childish treble, pipes
And whistles in his sound.

As You Like It, ii, 7.

"Syphilis was generally called the 'French disease,' but it was also termed the 'Neapolitan disease,' and the nasal speech produced by tertiary perforation of the palate is referred to, metaphorically, in the complaint of the wind instruments of the musicians:

"Olo. Why, masters, have your instruments been in Naples, that they speak i' the nose thus?"

Othello, iii, 1.

These quotations are sufficient to show that the Orator has what Shakespeare might have called "a pretty wit," and they will, we trust, stimulate our readers to obtain the volume and study the full address—



THE LATE DR. THOS. BARR.

THE
JOURNAL OF LARYNGOLOGY,
RHINOLOGY AND OTOTOLOGY.

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OBITUARY.

THE LATE DR. THOMAS BARR.

By the lamented death of Dr. Thomas Barr, a gap is made in the ranks of otology, which will be keenly felt not only by otologists, but also by the profession at large.

Thomas Barr was born at Elderslie, Renfrewshire, on April 18th, 1846. He received his medical education at the University of Glasgow, graduating in 1868 as a Bachelor of Medicine and Master of Surgery with highest honours, and in 1870 obtaining the degree of Doctor of Medicine.

In those University days he came under the influence of Lister, engaged at that time in promulgating the principles for which his name will ever be famous, and that influence can certainly be traced in the subsequent work of Dr. Barr.

In his early days Barr did not particularly concern himself with otology, for he was engaged nine years in general practice before he turned his special attention to that subject; but at the end of that period he proceeded to study, in Vienna, this branch of medicine under such distinguished professors as Politzer, Gruber, Schrötter and Urbantschitsch.

On his return to England he at once became identified with otology, and was appointed Dispensary Surgeon for Diseases of the Ear in the Glasgow Western Infirmary, a position he held for a period of 38 years. In 1879 he was appointed Lecturer on Aural Surgery in Anderson's College Medical School and also to the post of Honorary Aurist to the Glasgow Sick Children's Hospital. In 1884 he succeeded to the post of Aural Surgeon to the Glasgow Ear Hospital, now known as the Glasgow Hospital for Diseases of the Ear, Nose and Throat, a position from which he retired

only a short time before his death. On the University of Glasgow instituting a Lectureship on Diseases of the Ear in 1895, Barr was appointed to the post, which he held upwards of 36 years.

It is not too much to say that his classes attracted some of the keenest minds in the University, and otology must always feel a deep debt of gratitude to him for the impetus given to this branch of medical knowledge during his lectureship.

Many outstanding contributions to otology came from his pen, his chief works perhaps being his "Manual of Diseases of the Ear for Use of Students and Practitioners" (1st Edit. 1814, 4th Edit. 1909), "A Guide to the Examination of the Ear and Hearing" (1908), and his articles in the "Encyclopædia Medica" (1899) on the "Diseases of the External Ear," and in Allbutt's "System of Medicine" (1908) on "Methods of Examination and General Semeiology of the Ear." Besides these works he contributed from time to time papers of especial outstanding merit to the Proceedings of the many societies of which he was a member. For instance, in 1886 he read a paper on the effects of loud sounds upon the hearing of boiler-makers and others working in the midst of noisy surroundings before the Glasgow Philosophical Society, which attracted considerable attention; and at the British Medical Association at Birmingham in 1890 he read a paper recording his conviction that the ear was injuriously affected by the shrill whistles of railway engines, and he so impressed his hearers that a resolution was passed on the subject.

It would be superfluous for me to dilate upon the position which Dr. Barr held as one of the first of our aural surgeons, but it may be interesting to recall the fact that he acted as President of the Otological Section of the British Medical Association at its meeting in Glasgow in 1888, as President of the Otological Society of the United Kingdom during the years 1903 to 1905, as President of the Glasgow Pathological and Clinical Society 1899 to 1901, and also as President of the Scottish Otological and Laryngological Society at its meeting in Glasgow in 1911. It was Dr. Barr who conceived the idea of inviting the International Otological Congress to hold its 1899 meeting in London, and it will be within the recollection of all that he acted as Honorary Secretary of that meeting and fulfilled his duties with conspicuous success. Lastly, at the International Medical Congress held in London in 1913 he occupied the position of one of the Vice-Presidents of the Otological Section of that Congress.

Dr. Barr's work in the field of Otology is so well known to my *con-jrères* that it is unnecessary for me to enlarge upon it, but if I were to be asked what were the outstanding features of that work, I think I would answer that he was the most conscientious of clinical workers. To his patients he showed every consideration, and their care was always his first thought. His genial manner and delightful laugh charmed everyone

with whom he came in contact, and he had the gift of embellishing his conversations with pithy and quaint remarks, which at once endeared him to those with whom he was conversing. His pride in his City and University of Glasgow was very marked, and he gave very many years of useful service to their well-being.

Dr. Barr was taken ill in the autumn of last year, and from the first his physician held out very little hope of his recovery. By his death I and many others have lost a truly great and lovable friend and the profession an aural surgeon of the first rank whose work was based on the soundest clinical knowledge and experience. *Urban Pritchard.*

ORTHOPÆDIC TREATMENT OF LARYNGEAL STENOSIS.

BY CHEVALIER JACKSON, M.D.,

Pittsburgh, Pa., U.S.A.

IN cases of laryngeal stenosis of any kind, the testing of the ability to breathe through the mouth and the establishment of confidence in the oral breathing route have been best accomplished, in our experience, by the corking of the cannula, preceded, if necessary, by a reduction in the size of the cannula. The "cork," which is of rubber, has a slot cut in it, so that it diminishes the air passing through the cannula, but does not altogether obstruct cannular breathing. Gradually the air-leak past the cork is diminished until a solid cork can be worn while the patient is awake. The final test is during sleep. When the patient reaches the stage when sleep is quiet and restful without indrawing at the guttural fossa, at the epigastrium and around the clavicles, the cannula may be removed permanently. Of course it is necessary that the cannula be small, relative to the size of the trachea, in order to allow plenty of air to pass by it through the trachea; because it is, when corked, equivalent to a solid body of corresponding diameter. This method, developed and used for years by Dr. Ellen J. Patterson and the author, has been used successfully by a number of surgeons since its first publication.¹ In looking over the subject as there presented, it is noted that sufficient stress was not laid upon what we have called the "orthopædic" action of the method. By this we mean that in cases with more or less fixation of the crico-arytenoid joint, due to arthritis, perichondritis, or cicatricial adhesions, the enforced effort of compelling the patient to inspire through the larynx, forces the

¹ "Peroral Endoscopy and Laryngeal Surgery," by Chevalier Jackson, M.D.

maximum possible arytenoid movement upon the larynx. This tends not only to limber the stiffened joint but to develop the muscles atrophied from prolonged comparative idleness. The pull of the arytenoid upon a more or less cicatricially margined glottis tends, in time, to enlarge that glottis. In purely paralytic conditions the effect is often marked, especially if undertaken soon after the onset of the trouble. The greatest success is seen in children, in whom, naturally, one would expect the contributory aid of growth during the orthopaedic treatment. For success it is absolutely necessary to have nurses trained in tracheal work, because it requires experience and good judgment to determine the amount of obstruction to respiration the child can stand without injury. The best results are obtained in cases that have not been subjected to too much ill-advised active surgery, by thyrotomy, laryngostomy, etc. Success depends largely upon the amount of the intrinsic muscular tissue remaining.

SPHENOID SINUS: PRESENT DAY VALUE OF SURGICAL PROCEDURE.

BY ROSS HALL SKILLERN.

Philadelphia, U.S.A.

1. Operations.

THE recognised procedures of to-day of operating upon the sphenoid sinus can be divided into the intra- and extra-nasal. As the latter (extra-nasal) is never used except when other sinuses are co-affected, we will consider more particularly those operations which are performed through the nose. By this method the anterior sphenoidal wall is invariably attacked, although the ways and means are often divergent, as for example Schaffer (1) used a sharp curette, Spiess (2) penetrates the sinus with an electric trephine, Grünwald (3) a conchotome, Andrews (4) a curved knife, Grayson (5) a hand-burr, etc., etc., with or without the removal of the middle turbinate, but it was not until Hajek (6) published his paper in 1904 that the operation assumed a definite form in progressive steps. Briefly, his method is as follows: The posterior half of the middle turbinate was removed by means of the scissors and snare, the posterior ethmoid cells (superior turbinate) broken down with a hook and removed piece-meal, thus baring the anterior sphenoidal wall. This ostium of the anterior wall he removed in its

entirety with his heavy bone forceps especially designed for this work. This method, modified as occasion may demand, is the one in general use at the present time. As this is, also, the most radical intra-nasal operation on the sphenoid that we have, the modifications consist in the preservation of the middle and superior turbinate and in the size of the opening made in the anterior sphenoidal wall. We can divide the intra-nasal operation into the conservative and radical; the former preserving the middle turbinate and all or most of the superior turbinate with more or less enlargement of the natural ostium, and the latter sacrificing these structures with the removal of as much of the anterior sphenoidal wall as possible. In the former the nasal structures are almost undisturbed, in the latter the posterior half of the internal nares is practically exenterated.

2. Indications.

As the conservative method may to all intents and purposes be considered but a step in the radical, one is justified in all doubtful cases in giving the patient the benefit of the doubt, thus, when symptoms point to some disturbance in the sphenoid region which demands surgical intervention in the form of aeration and drainage, it is unquestionably poor judgment to open up the sphenoid in its entirety when the judicious enlargement of the sphenoid ostium with the Faraci forceps will suffice to bring about a cure. As a matter of fact the positive indications for the radical operation are so few that they can be enumerated as follows:

(1) In the classical form of chronic sphenoid sinusitis with typical pain, profuse discharge, and occasional symptoms of retention where one has reason to believe permanent pathological changes have taken place in the mucosa.

(2) When orbital or cerebral complications threaten or have occurred.

(3) Where the conservative method has been tried and found ineffective in bringing about a cure.

(4) In mucocele or pyocele of the sinus of long standing.

While these may represent the classical indications, nevertheless there is one factor that must invariably be reckoned with which will greatly influence our form of procedure, *i. e.* the anatomical configuration of the posterior ethmoid and sphenoidal regions. It will be remembered that the anterior sphenoidal wall is composed of two portions, the nasal and the ethmoidal. The nasal or

free portion represents that part lying free in the nose between the septum and the superior turbinate, and contains the sphenoidal recess. The ethmoid portion lies behind the last of the posterior ethmoidal cells, representing a ratio of about three to five, the nasal portion being the smaller. This ratio is subject to great variation, the nasal or free portion often presenting but a mere slit, particularly so after inflammatory changes have taken place. Given then that such circumstances obtained, it would practically be impossible to perform the conservative operation (simple enlargement of the ostium) even though it was clearly indicated by the symptoms present. On the other hand, with an excessively wide *pars nasalis*, the middle turbinate being inrolled against the lateral nasal wall, thus bringing the anterior sphenoid wall into clear view by anterior rhinoscopy, an extensive radical operation on the sphenoid can readily be made without in any way injuring the middle or superior turbinate, not to mention the posterior ethmoid cells.

It will thus be seen that the disposition of the structures lying in front of the anterior sphenoidal wall will guide us largely as to the form of operation that will be necessary. A sufficient portion of these structures must either be removed or pressed to one side to enable one to have free access both visual and workable to the anterior wall.

3. Value of Present-day Methods.

Before discussing the method now at our disposal we must consider the various forms that one is liable to meet in diseased conditions of the sphenoid.

Acute Inflammation.—I doubt if one is ever called upon to treat acute sphenoiditis *per se*, that is, without the rest of the nasal mucosa being involved. It is, of course, possible for general acute infection of the Schneiderian membrane to undergo resolution leaving a focus of inflammation in the sphenoid sinus, but under these circumstances the disease is more or less subacute. The nearest we come to a genuine acute purulent sphenoidal empyema is the acute exacerbation of a chronic sinusitis, particularly when stagnation of the secretion occurs. As this takes on the characteristics of a pyocele it will be dealt with later.

Catarrhal Inflammations.—This condition is one of the commonest and least recognised of all the diseases which involve the accessory sinuses. Here few of the classical symptoms are

observed, but rather the persistent pharyngitis sicca, post-nasal discharge, fullness and dryness in the naso-pharynx, hawking and rasping in the morning point to a diseased condition in the posterior part of the nose. Casselberry (7) has well described this form of affection. Rarely does it become frankly purulent or show marked exacerbations, but tends to continue in about the same degree of inflammation. Simple enlargement of the natural ostium in order to further aeration and drainage will usually suffice to bring about a complete cure. Irrigation is unnecessary, as the mucosa is but slightly affected and will throw off the infection when aided by ventilation. The value of the conservative operation in this form of disease is unquestioned, and should deserve wider appreciation than it now receives.

Chronic Purulent Inflammation.—In this form the mucosa is infected in local areas, some portions being more or less healthy. The characteristics of this type are remittent. Exacerbations occur in which the symptoms become pronounced, the discharge is profuse, typical headaches appear, etc. During the quiescent stage the symptoms abate, but there is always a certain amount of post-nasal discharge, dull headache, and a marked tendency to "catch cold." In fact, the patient must always exercise the greatest care against excesses of every sort, particularly eating heavy food at night, alcohol, tobacco, and mental stress or strain.

The conservative operation here also offers great possibilities. The installation of a good-sized opening in the anterior wall without disturbing the middle or superior turbinate will often furnish the desired result. The Faraci bone-cutting forceps is an ideal instrument for this purpose. After the ostium is found by means of the probe and long Killian speculum it is a simple matter to insert the end of this slender instrument and bite away as much of the anterior wall as desired, at least enough to warrant thorough ventilation and the best of drainage. Of course, if anatomical formations prevent the carrying out of this procedure, removal of the impeding structures to such an extent that this purpose may be accomplished is necessary and naturally indicated. Even if this is carried out during an acute exacerbation its value is at once manifest, for the symptoms promptly subside without further treatment and gradually become less and less apparent until they disappear entirely, together with the patient's susceptibility to take cold or to the excesses which previously had been denied him.

Chronic Purulent Inflammation with Permanent Pathologic

Changes in the Mucosa and Underlying Bone.—This is the typical sphenoidal empyema of the text-books, and one which is much more seldom met with than either of the two preceding. It is, of course, but an advanced type of these, but when it once occurs the symptoms admit of no doubt as to the condition present. All the classical symptoms appear and are marked.

The radical intra-nasal operation was devised to meet this condition. As the posterior ethmoid cells are usually involved their removal serves as a double purpose, to take away the infected cells as well as to gain room in order to open the sinus to its widest extent. The *rationale* of this method is to eradicate as far as possible all diseased tissue, with complete ventilation of the operated area.

Mucocele.—Pent-in collections of mucoid material within the sphenoid sinus are more or less rare, although they have been reported by Rhese (8), Benjamins (9), and others. Obviously here the radical operation is indicated, as the mucosa has been converted into the lining membrane of the sac, and will probably never return to its original form. It is, moreover, a well-known fact that unless a large portion of the wall is resected the mucocele tends to re-form; at any rate the sac wall continues to secrete for months. Mucoceles in themselves are rarely dangerous except from pressure, as they tend to assume enormous proportions, causing the osseous walls of the sinus to fairly melt away under their slow but steady pressure. The radical operation will at least put a stop to its subsequent growth and rob it of its dangers, although it is doubtful if the parts ever again assume their normal condition. A catarrhal discharge usually follows and continues in greater or lesser intensity *ad infinitum*.

Pyocele: Closed Empyems.—A collection of pent-up pus in a sinus results either from the drainage passages becoming suddenly closed during an attack of empyema or from a mucocele becoming infected (rare). In either case it is necessary to perform a radical operation as soon as possible after the diagnosis is made. Its value in this particular incident will largely be determined by the severity of the infection and the length of time which has elapsed between the onset of the symptoms and the surgical intervention. The earlier the intervention, the greater the possibilities of success. However, no case can be considered hopeless unless some grave complication such as purulent meningitis, cavernous sinus thrombosis or brain abscess supervene.

4. Individual Methods and their Values.

Means Employed to Primarily Open the Sphenoid: The Curette.

—This instrument, first utilised by Schaffer (1), is the method now in use by Killian (10), Hinkel (11), Mosher (12), Coakley (13), Curtis (14), and many others, and usually involves a very simple technique. After the anterior wall of the sphenoid is brought into view (either by removing a portion of the middle turbinate or in favourable cases by merely infracting that structure against the lateral wall of the nose), the ostium of the sphenoid is sought, or failing to find it, the anterior wall is broken in at its thinnest part or the point of least resistance to the instrument. This is always in the neighbourhood of the ostium and high up on the wall. After an opening has been installed and the proper orientation obtained by means of the probe, the break is enlarged by suitable forceps to the desired size. Killian and Mosher vary this by preserving the middle turbinate and excavating, so to speak, the anterior and posterior ethmoid cells until the anterior sphenoidal wall is reached. It is then opened by pressing it in with the beak of the instrument. The comparison of value of these methods depends upon the anatomical configuration of the particular case at hand. If the middle turbinate is rolled in close to the lateral nasal wall, thereby presenting a large nasal portion of the anterior wall of the sphenoid so that the ostium is more or less convenient to the end of the probe, there is no question that the direct method, or that one which leaves the ethmoid cells intact, is the one to be preferred. Even if the ostium is found without being under direct control of the eye, it is perhaps better to attempt to open it, using the probe as a guide, for once being opened it is comparatively easy to enlarge the break until a portion of it is plainly visible. The naso-pharyngoscope may be of great value in determining the precise location of the ostium. The great advantage of this method is that the ostium is used as a landmark, *i. e.* a point of entrance.

In the indirect method (through the ethmoid cells), the middle turbinate is used as a guide until the posterior cells are encountered. It has the advantage that it strikes the thinnest portion of the front wall of the sphenoid (*pars ethmoidalis*) and permits a much larger opening than the previous method through the sphenothmoidal fissure. It is of particular value where the posterior portion of the nasal septum is deflected toward the diseased side or where the middle turbinate is crowded against the septum. Its

chief disadvantages are that the sphenoid ostium cannot be well utilised as a point of orientation, and that even in skilled hands it is not entirely without danger (15), certainly much more so than the inside method.

The Sharp Hook.—This instrument originated with Hajek (16), and has found many advocates—Tilley (17), Onodi (18), Logan Turner, Boenninghaus (19), etc. The instrument being long and slender permits its introduction through a very narrow olfactory fissure until the sphenoid wall is reached. A few well-directed scrapes open up the sinus. This instrument is of great value, particularly where judiciously applied, as it is always working away from the points of danger; the only possibility is a sudden breaking in with injury to the lateral sinus wall and the dangerous or even fatal hæmorrhage that will surely follow (20). On this account the instrument should not be used blindly, but the ostium sought for and the wall opened in its immediate neighbourhood. If, however, the ostium has been found, the need for the hook is at once superseded by the much safer curette. The one eventuality where the hook has served me to good purpose was when the landmarks had become obliterated by blood and torn tissue and where it was necessary to proceed very slowly, as much finer work can be done with its sharp point. The various cells were cautiously opened until at last the sphenoid was reached and the sinus entered through the thin plate which separates it from the posterior ethmoid cells (pars ethmoidalis). When used under these circumstances the instrument possesses a decided value of its own.

The Curved Knife.—Andrews uses this instrument, which to all intents and purposes is a sharp hook with rounded end, and is manipulated as is the Hajek hook.

Electric Trephine.—Ingals (21), Spiess (22), Stake (23), Stoeckel (24), and Halle (25) have at one time or another advocated this means of penetrating into the sphenoid. At first glance this would seem to be an ideal method, but taking all things into consideration it had best be left in the hands of the few that have become skilled in its use. Ingals and Spiess penetrated the middle turbinate, but I presume that they have now abandoned this route. Halle has perhaps perfected the method to the highest state of efficiency, having previously made a crossed incision through the muco-periosteum of the anterior wall and resected back the four flaps, thus exposing the bare wall to his burr. The main disadvantages would seem to be the manual control of the instrument, for even with the steadiest hands a slip is liable to occur,

and it only means a very little slip with a rapidly-revolving cutting instrument to cause serious or even fatal injuries.

The Chisel.—Zarniko (26) and Gmeinder (27) have constructed long, thin guarded chisels to crack an opening into the sinus. I have never used these except upon the cadaver, and in this way have learned their danger, at least in my own hands. The guard is about 7 mm. behind the point. If the anterior wall is somewhat thick the edge of the instrument is often directed upward, and when it suddenly penetrates the sinus it is liable to impinge rather sharply against the superior wall. Holmes (28), Onodi (29), Loeb (30), Meyer (31), Prentiss (32), and many others have reported cases in which a dehiscence was present in this wall, and oftentimes the optic nerve was lying free within, only protected by a covering of mucosa. Injury to the sheath could cause blindness on that side, and at the same time become the starting point for a subsequent meningitis. This method, compared to the others, has little to recommend it.

Evulsor.—The object of this instrument was to penetrate the ostium, then by springing the blades apart to enlarge the opening from within outward, thus working away from the dangerous structures, at the same time bringing the fragments of bone and mucosa into the general nasal cavity (33). In those cases where it is possible to lay bare the ostium it serves its purpose well. On the other hand, unless a straight passage to the anterior wall is obtained, the instrument is too thick to accommodate itself to the narrow or crooked route presented. On the whole, it is more valuable in the radical method where a large passage is assured with the ostium in plain view.

The Forceps.—Luc (34) used his ethmoid crushing forceps in order to reach and open the sphenoid, but Faraci (35) has constructed a bone-biting forceps which are ideal for the purpose. They are exceedingly thin, but strong, and have a lance-shaped end. After the ostium is found with the probe the lance end of the instrument is pressed in and the wall removed from behind forwards. Owing to the peculiar construction of the biting end this can be accomplished with astonishing ease and celerity, and almost as much of the wall can be removed as with the heavier types of forceps, such as Hajek's. This, I think, represents the greatest advance in operations on this structure, and is the present-day method of choice in our clinic.

Hand Burr.—The idea of this instrument was conceived by Grayson (5) for the purpose of making an exploratory opening

into the sinus, which can also be utilised for therapeutic purposes. The perforation is made as close as possible to the angle of junction of its floor with its internal wall, and is 2 mm. in diameter, a size claimed to be quite sufficient to permit the escape of any fluid from within the sinus or the introduction of the jaw of a biting forceps for the purpose of enlarging the breach. He contends that the opening is perfectly situated for drainage and one through which the cavity can be thoroughly cleansed, also advocates beginning the radical operation at this point. The value of this procedure can be judged by comparing its advantages and disadvantages, both practical and theoretical.

Advantages, Anatomical.—All things being considered, it attacks that portion of the sinus wall most available to instrumentation. It is easy to accomplish, as far as the actual manipulations are concerned. Its only danger is the possibility of wounding the sphenoidal artery. It can be applied when the anterior face of the sinus is difficult of access.

Disadvantages, Anatomical.—The thickness of the sinus wall as well as the hypertrophy of the diseased lining mucosa may prevent reliable conclusions from being drawn as to the pathological state of the interior. Logan Turner has shown that even after an extensive breach has been made it is difficult to judge the exact condition of the mucosa without a bacteriological examination, as disease can be present without immediate manifestations after the sinus is opened. I have substantiated this statement in a considerable number of cases. Even if the sinus contained large quantities of pus, the opening is so small that during lavage such a slight amount would be brought out at once that it would be lost in the interstices of the posterior nares before it appeared in the pus basin. Another factor is that the burr is so short and dull that it enters so slowly as to easily lift up the thickened mucosa from the underlying bone, thus causing the attempts to irrigate abortive. Accepting, however, that the exploration had been successful and pus had been found, the opening is too small to permit sufficient drainage or effective treatment, which are further made more difficult by the tendency of the wound to close, which it does, as Grayson admits, in twenty-four hours.

As a starting point for the radical operation such a small opening (2mm.), particularly when the bone is thick, as it is so prone to be in this particular locality, offers but a poor hold for any sphenoid forceps except possibly the Faraci, which one would hesitate to use on account of the grave risk of breaking the point off in the sinus.

Local or General Anæsthesia.—In all intra-nasal operation on the sphenoid sinus (except in children) local anæsthesia is far preferable, for it is a great advantage to have the co-operation of the patient. The pain is practically *nil*, the one unpleasant feature being the crunching and crackling of bone so deep within the nose. Only in those cases where the patient is extremely nervous or the disease has so far progressed that he is semi-moribund, is general anæsthesia indicated. In these cases a rapid and thorough operation is required in order that the patient can be returned to bed as quickly as possible with the least possible shock.

5. Possible Accidents During Operation.

Hæmorrhage.—Under ordinary circumstances the bleeding met with during and after the operation is trivial, provided one does not go down too deep into the sinus floor. The source of dangerous hæmorrhages while opening the sinus is the sphenoidal branch of the naso-palatine which traverses its floor. After the sinus is opened, the cavernous sinus lying laterally is to be avoided, as two cases of accidental injury to these veins during curettement have been reported. One was fortunately controlled by tampons, but the other resulted fatally (20).

Rhinorrhœa Cerebro-spinalis.—The escape of cerebro-spinal fluid has also been encountered (36, 37); in these cases the gradual discharge continued for about twenty-four hours, then ceased, without apparently producing any untoward symptoms.

During Irrigation.—After the sinus has been thoroughly opened it is unwise to irrigate except under very slight pressure, as symptoms of cerebral irritation (vomiting and unconsciousness) have followed (38).

Applications of Strong Antiseptics to the Sinus Mucosa.—It is unwise to apply any irritating solutions directly after an operation, as the already inflamed mucosa shows a great tendency to post-operative swelling. Nitrate of silver in particular will often cause an exacerbation of the symptoms and retard resolution.

Packing Tightly with Gauze.—If one wishes to provoke alarming symptoms, this procedure will certainly accomplish the result. Hajek (39) long ago called attention to it, and I can substantiate his experiences. All the signs of beginning cerebral involvement appear and continue until the packing is removed, and, indeed, not infrequently for some days thereafter. The irritation to the mucosa produces a swelling which cannot be taken up by the

tight gauze packing; consequently there results great pressure within the sinns.

6. After-treatment.

Subsequent treatment is as a rule simple. The one object is to provide sufficient drainage and aeration to the diseased mucosa. Directly following the operation it may swell up into a thick œdematous cushion which nearly fills the sinns, due to post-operative reaction. On inspection actual polypoid hypertrophies may be present. One is tempted to use the curette at this stage, but it is interdicted. The swelling usually subsides in a few days under proper drainage, and I have seen actual polyps disappear spontaneously. If after a week or ten days necrotic spots still persist the curette may be gently used (only on the floor and septum) to remove them (6).

As the opening shows a great tendency to close through granulation tissue springing up, the edges should occasionally be touched with a bead of nitrate of silver. Post-operative hæmorrhage has been known to occur as late as the fifteenth day (40); five cases also have been reported as occurring on the seventh to tenth (42, 43, 44, 45, 46), one of which (40) required ligation of the external carotid.

As far as tampons are concerned, they had best be entirely omitted. The sinus will drain better without them, and it is now the consensus of opinion that to promote healing they are without value and may even exert deleterious influences. Only for the purpose of controlling hæmorrhage should they be placed in the sphenoid sinns (41). Even though there is not much pain, it is well to administer an opiate in the evening to insure a good night's rest.

7. Immediate and Ultimate Results.

Conservative Method.—In those cases in which the mucosa only requires aeration and better drainage in order to throw off the inflammatory process, the simple enlargement of the ostium without injury to the adjoining structures will give brilliant results. The relief to the patient is almost immediate, with practically no discomfort in the form of pain or hæmorrhage. After the slight post-operative swelling subsides the nose looks, and is to all intents and purposes, perfectly normal. It is true that the enlarged ostium rapidly contracts until it assumes its original size, but in the meantime the patient has become cured

Radical Method.—It is often marvellous, the effect on the symptoms which this operation produces even in the severest cases. The excruciating pain is almost instantly relieved, or at least so mitigated as to become bearable (47); the patient seems at once to be transported into another atmosphere, from a desperately sick individual to one that is on the road to recovery. Meningeal symptoms (48) and cerebral manifestations (49) rapidly begin to clear up. Kander (50) and Avellis (51) have reported cases which had gone on to meningitis cured, to which I can add two more. One patient was moribund and had been so for forty-eight hours, and required practically no anæsthetic at the time of operation. Four hours afterwards he was demanding something to eat. The temperature curve assumes a more normal one, and the patient usually goes on to an uneventful recovery.

As far as the parts themselves are concerned one would expect a considerable reaction to follow such an extensive procedure (removal of middle turbinate, posterior ethmoid cells and anterior wall of sphenoid sinus), but such is usually not the case. The patients complain of little pain, although there is a constant leakage of sero-sanguineous fluid for eighteen to twenty-four hours. The internal engorgement is marked, which usually affects the opposite side, compelling the patient to breathe through the mouth until it becomes reduced, which usually begins to occur at the end of the second day. The swelling gradually subsides until the normal is reached, which is from the seventh to the tenth day.

Nature seems to take care of the void in the same manner as it does the tonsillar fossa after a tonsillectomy, as it becomes more or less filled with granulation tissue. I might add I have never seen a dry nose follow this operation, no matter how extensive the procedure.

Concerning the sinus itself a large percentage recover entirely (52), but it must be remembered that its resistance is lowered and it will become reinfected with subsequent attacks of coryza and the re-formation and secretion of pus. This, however, clears up readily under appropriate treatment.

8. Value of the Operation.

It would seem almost superfluous, from what has been said, to discuss this phase of the subject. While its curative value alone in sinus disease makes it invaluable to the rhinologist, the brilliant and dramatic results are those obtained when grave cerebral and

orbital symptoms have supervened. Many cases of progressive blindness have been reported which recovered their vision (53, 54). I can substantiate these results in several incidents. Many other ocular conditions as well as symptoms remote from the seat of infection have been cured by a timely radical upon the sphenoid.

Sitting, then, in calm judgment upon the merits and demerits of the endo-nasal sphenoid operation, one must necessarily come to the conclusion that on account of the almost uniformly brilliant results obtained and its comparative freedom from danger, it must be classed as a procedure that no rhinologist of the present can afford not to master.

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METHOD OF CLOSING POST-AURAL FISTULA.

By L. J. CURTIN, M.D.,

Rhinologist and Aurist, Hume Street Hospital, Dublin.

G. C——, AGED eleven, was admitted to hospital for fistula in the right mastoid region. A few days previous to admission he suffered from pain in and around the ear. On admission, examination revealed a jagged fistulous opening over the middle of the mastoid process and some unhealthy bone at the bottom of the fistula, as well as inflammatory trouble round the fistulous area.

Two years previously a simple mastoid operation was performed on the affected side.

I determined, as the drum was practically destroyed and the hearing reduced to two metres, to do a radical mastoid operation. The original fistula was scraped and healed readily. However, on the sixth day following operation, one of the stitches showed signs of cutting through. I waited for a couple of weeks in the hope it would unite, but this did not occur.

As the edges of the fistula became epidermised the suitability of a plastic operation to close the new fistula had to be considered.

Owing to the fact the skin covering the mastoid process was thin and firmly bound down to the bone, the Moseteg-Moorhof method of turning a flap forward or from below was out of the question, neither was the Passow-Trantmann method, from a consideration of the already mentioned conditions, practicable.

It occurred to me that two obstacles in the path of successful healing could be overcome by (a) union of the wound in a linear fashion, (b) avoidance of tension on the sutures. This was accomplished in the following way: A new incision was made three-quarters of an inch behind the one for the radical mastoid. A thin elevator (one used for the septal resection) was introduced from behind underneath the periosteum, the latter with the

overlying skin being freed from the bone as far forward as the fistula. The edges of the fistula were freshened up and two sutures held the linear wound together. The posterior incision was allowed to gape, but the intervening space was filled up by a skin-graft from the inner side of the arm and held in position by three sutures. The result proved to be a happy one. Tension was relieved, healing followed by first intention, the only drawback encountered was that the meatal opening at the entrance narrowed somewhat at first, but this rectified itself later as the wound sank.

I have seen the boy four months since the plastic operation was performed. A slight meatal narrowing still persists.

Epidermisation is complete in the ear and the mastoid region presents a healthy scar.

SOCIETIES' PROCEEDINGS.

PROCEEDINGS OF THE AMERICAN LARYNGOLOGICAL ASSOCIATION.

Held at Washington, D.C., May 9, 10, and 11, 1916.

EMIL MAYER, M.D., Abstract Editor, New York.

President's Address.

THE PRESIDENT, Dr. G. Hudson-Makuen, of Philadelphia, took as his subject: **The Psychology of Diseases of the Respiratory Tract.**—While the speciality of laryngology is dependent upon all the various specialities in medicine, its future progress and development depends chiefly upon a knowledge of psychology and its related branch, neurology.

Psychotherapy has been practised after a fashion since the beginning of the history of medicine, but it has not kept pace with the other forms, the chief reason for this being that the successful practice of psychotherapy requires on the part of the practitioner the profoundest knowledge of both medicine and man, and especially man. Few physicians are mentally and temperamentally capable of practising psychotherapy, and the improved curricula of the schools do not supply the rising generation of specialists with the assistance which they should have.

Since many of the diseases of the respiratory tract are purely functional and of psychic origin, the laryngologist should be able to distinguish between those of his patients, who are psychopaths and neuropaths, and those who are suffering from actual organic diseases. He should realize that to treat a purely psychic case by physic measures is not only useless but, in many instances, absolutely harmful; and to operate merely for the psychic effect of the operation is exceedingly questionable surgery.

Psychotherapy in the form of education and reeducation should always be used, in addition to the necessary medical and surgical

measures, for the relief of disturbed respiratory, phonatory, and articulatory functions. It is not enough to do operations for the correction of disturbed functions without at the same time or immediately thereafter doing something in an educational way to correct the faulty habits which accompany, either as cause or result, the conditions that we are seeking to modify or cure. An example of the psychophysiologic habits that arise owing to functional disturbances due to organic lesions is found in the speech of the patient having a cleft palate. When this characteristic speech has developed, no amount of adequacy or efficiency of the palate brought about by operative measures, can in itself appreciably change or improve the speech, because the individual accepts his old speech as normal speech.

This principle obtains in all our operations upon the respiratory tract, the object of which is to correct faulty functioning. Its value is apparent in dealing with disorders of speech, the treatment of which does not differ from other disorders of the respiratory tract. Formerly, surgeons operated not alone upon diseases and abnormal structures, but also upon perfectly normal structures, not hesitating to remove cross sections of the tongue and epiglottis, in the hope of curing stammering. To us of the present day this is absurd, for we know that stammering in the great majority of instances is of psychic and not of physical origin, and to cure the affection psychotherapy is quite as important as physiotherapy. What is true of stammering is also true of the other forms of defects of speech.

As the medical profession has been slow in recognising that stammering and other defects of speech are largely of psychopathic origin and require for their cure psychotherapeutic measures, so have we been slow in recognising that many forms of asthma, sore throat, and difficult nasal breathing are of similar origin and require similar treatment.

In no speciality of medicine is the importance of these matters so apparent as in our own, for in no speciality is the psychic element so great a factor in the causation not only of functional but of organic disorders as well. In this connection it must not be overlooked that faulty methods of breathing, vocalisation, and articulation, although at first of psychic origin, frequently result in organic diseases which cannot be differentiated from diseases having purely physical bases.

A study of the psychobiologic phenomena as they appear in a given individual is merely a study of his reactions to his environment; or, in other words, a study of what has been called his mentation, behaviour, and personality.

The new psychology, therefore, teaches us not merely how to treat diseases of special organs, but it teaches us how to treat the patient himself or the reactions of the patient to these particular diseases. A knowledge of this psychology will broaden the scope of our work, and it will tend to make a medical education absolutely necessary to those desiring to practise the various forms of the healing art; but so long as physicians generally disregard this fact, so long shall we have non-medical practitioners, such as Christian scientists, osteopaths, hydropaths, and all the others of their kind, actually invading our field of operation.

On the Relation of Diseases of the Accessory Sinuses to Diseases of the Eye, especially in Children, with a Report of Two Cases.—J. H. Bryan (Washington).—Diseases of the sinuses occurring in children have been only slightly considered, for the reason that these

cavities in the very young are supposed to be so small that there could not be an inflammation sufficiently severe to cause any serious disturbance of the eye.

That these premises are entirely wrong is evidenced by the report of the following cases:

CASE 1.—A male, aged eighteen months, had a very marked exophthalmos on the left side following an infection from influenza. On admission to hospital his temperature was 104° F., some secretion was flowing from the left nostril, there was marked bulging of the left eye downward and outward, lids and conjunctivæ were oedematous, and the periauricular glands were enlarged.

Seen by the speaker in consultation, the diagnosis of orbital abscess resulting from an infection through the ethmoid cells was made. The radical operation was then done, the incision commencing at the junction of the middle and outer third of the supra-orbital ridge, and was carried inward and downward along the inner border of the nose below its middle. The periosteum along the inner wall and the corresponding parts of the roof of the orbit was stripped from the bone, and in doing so a large quantity of pus was evacuated. The whole of the inner wall of the orbit was removed back as far as the sphenoid. The ethmoid cells were found to be badly diseased, especially the middle and posterior portion, and from the condition found it was apparent the orbital abscess resulted from a direct infection from the middle and posterior ethmoid cells. The amount of pus evacuated was enormous, when we take into consideration the age of the child and the stage of development of these parts at this age. The abscess having been thoroughly evacuated, a strip of iodoform gauze was placed in the orbit back of the eye and brought out through the nose, and a small gauze drain was placed just inside of the inner canthus, and the external wound closed by interrupted sutures. The child made an uninterrupted and quick recovery, the eye gradually receding soon assumed its normal position. This is the youngest patient the speaker had ever seen with such diseased conditions.

CASE 2.—Negro boy, aged eleven, had bulging of the left eye to a marked degree downward and outward. An absence of pus anywhere within the nose and no signs of caries or necrosis. X-ray examination showed no abnormality except that the left orbital cavity was apparently filled with a dense mass which seemed confined to the orbit. Because of all these negative examinations it was believed that there was a growth in the orbit behind the eye. Exploration of the orbit showed that at the junction of the middle and posterior portion there was a decided bulging of the ethmoid toward the orbit. With a probe the cells were perforated, and a large quantity of pus was evacuated. The whole of the inner wall of the orbit, including all the ethmoid cells, was removed as far back as the sphenoid, and in doing so a large abscess involving the posterior ethmoid cells and the sphenoidal sinus was found. The sphenoidal cavity was unusually developed and filled with thick, creamy pus. All diseased bone and purulent secretion having been thoroughly removed, an iodoform gauze packing was placed in the sphenoid and ethmoid regions, one end being brought out through the nose and the external wound closed by interrupted sutures. At the end of the second day the gauze drain was removed and the nose gently irrigated with a saturated solution of boracic acid. The patient made a quick recovery, the eye gradually receding within the orbit, and at the end of the ninth day he was discharged from the hospital.

CASE 3.—Male, aged thirty-six, had thrombosis of the cavernous sinuses. Under ether anaesthesia the speaker removed the middle turbinals and opened both sphenoidal sinuses, finding some muco-purulent secretion in both cavities. Examination of the secretion taken from the sphenoidal sinuses showed both streptococci and staphylococci present. A lumbar puncture showed the spinal fluid under great pressure, filled with pus-cells, roughly estimated at 40,000 per mm. Polymorphonuclear leucocytes predominated. The condition of the patient grew rapidly worse and he died.

Post-mortem Examination.—The head only examined, showed all the sinuses contained dark and semi-fluid blood; small hæmorrhages on the right half of the cribriform plate of the ethmoid bone. Vessels of the pia mater generally engorged, the basilar surface of the brain showed fibrin and a purulent exudate under the pia, especially on the insula and adjacent opercula. Microscopic examination showed the vessels of the brain engorged. Beneath the membrane was a thin layer of brown material intimately adherent to the brain substance beneath. On section the brown substance showed brownish points near the surface, the brown exudate under the membrane showed fibrin, red blood cells and mono- and polymorphonuclear round cells.

Dr. LEWIS A. COFFIN: Dr. Bryan's experience is unique, I think, in the extreme youth of his first patient—eighteen months old. My youngest patient was six years old. I reported a case before this Society in Boston, a case of thrombosis sinus cavernosus, upon which I had operated. That case has been very instructive to me. I think we lose sight of the fact that these ethmoidal veins for the most part empty into the ophthalmic veins. Now, if we know anything at all about a thrombus and its cause, where is there a more favoured place for it to develop?

Then there is another thing—when we operate those cases, they bleed very profusely. Why other cases do not bleed the way they do, I cannot tell. I am reminded of the case of a girl who was absolutely blind in one eye for four weeks, with a choked disc. I did a radical operation on her, and it was absolutely impossible for the man with me to sponge it so that I could see from the field of operation. I have had several of those cases of serious bleeding, just the same as if you put a stricture around the leg. To return to that case of cavernous sinus which was so interesting and instructive to me. Dr. Coakley saw that patient in consultation with me, and we both felt acute sphenoidal sinusitis was present. Another consultant said: "We think you have probably saved her life by the great bleeding." What I am going to do now with these cases is to give treatment in the shape of great big doses of lemons and lemonade.

I recall one case which was referred to me in which I really could not make out much sinus trouble, and I told the eye man to put her on big doses of lemonade and keep her on it, and the eyes cleared up. Of course, the whole thing is to reduce the coagulability of the blood. Finally, we must work out the relationships of this circulation.

Dr. CORNELIUS G. COAKLEY: I saw a child, aged two, a robust child, with a swelling around the left orbit, exophthalmos, protrusion of the conjunctiva and swelling down on the face, with a sero-sanguinous discharge from the left nostril. Bacteriological examination of nasal discharge showed streptococci; the variety, however, was not worked out. Child had an acute nephritis with a marked amount of albumen and casts—hyaline, granular and epithelial. There was also an endo-

carditis of sudden onset; the abdomen was also swollen. It looked very much as though it was only a question of time before the child would die, so we all thought it best to try and open up the cheek. Following that the stools had a large quantity of bloody, purulent discharge, and of course the prognosis was extremely bad, for it looked like a general infection. A blood culture was taken and the following morning was reported upon as being very markedly positive. A blood transfusion was done from the father to the child. I expected to hear of the death of the child within three or four days, and two weeks later I heard the child was perfectly well. I think the point is most valuable in the treatment of these cases. On account of the general condition, I advised against sewing up of the orbit. Some time previous to that I saw a child, aged five, in consultation. This condition followed one of the exanthemata. That child was later operated upon.

I also saw a case last winter of cavernous sinus thrombosis, one most interesting as to the source of infection. The patient was a man who had not been feeling particularly well, and a diagnosis of carious teeth and abscess of a tooth was made. He went to the dentist with that diagnosis. This was not the diagnosis of his own dentist, but had been made by another dentist, and the diagnosis was disputed. Fortunately, the dentist who made the diagnosis had taken radiographs of the teeth and sinuses, and I was much surprised at the good radiograph he obtained of the sinuses. This was a week before I saw him. The frontal sinuses, ethmoid, sphenoid and antrum appeared perfectly normal. He showed me what he called an abscess, which may have developed a swelling around the orbit and along the eye on the opposite side from where a molar tooth of the left upper jaw had been removed. The swelling first began in the right eye. We put a hole in the antrum and drained it and a few days afterwards the opening was practically dry.

I saw the patient of whom Dr. Coffin spoke. I think we have two types of cavernous sinus thrombosis—the type that is infected, and the type that is inflammatory. If you get an infected cavernous sinus thrombosis, you are bound to have it end fatally; but if you get one in which the organism is very mild, why there is a possibility of recovery.

Dr. HANAU W. LOEB: I would like to make a suggestion with regard to the statement made by Dr. Coffin as to our lack of knowledge of the venous relationship. We might of course learn the names of each trunk, but I think we would find that we would not be any better off. But we do know there is a very abundant venous distribution in this region, and having that abundant venous distribution, we naturally have results of infection in the neighbourhood, and that undoubtedly accounts for the majority of infective conditions in the orbit coming from the nose. However, there is such a thing as a condition resulting from mere nearness to an acute inflammatory condition. For instance, we know that acute oedema results in the larynx from inflammation in the neighbourhood. A year ago I reported a case before this Society in which blindness had resulted from a case of acute ethmoiditis, and the blindness disappeared within a week after operation upon the ethmoid. At that time, too, I called attention to an observation made from studies in the neighbourhood of this region, that whereas the posterior ethmoidal cells replace the sphenoid, the optic nerve, instead of being at a considerable distance from the ethmoid, runs along the

lateral wall of the posterior ethmoid cells. This so happened in three out of thirty cases I had examined on account of the commonness of acute inflammation of the sphenoid. On this account I thought that the condition of results in the eye was as uncommon as it is believed. Now, there is a further observation which I might make, that when we do have a condition of acute inflammation of the optic nerve, it is because the posterior ethmoidal cells have replaced the sphenoid, but the nerve, instead of running at some distance from the sinus, runs along from the lateral wall.

(To be continued.)

Abstracts.

NOSE.

Submucous Resection of the Septum.—Lateruadie. "Proceedings of the Parisian Society of Laryngology, Otology, and Rhinology," January 10th, 1914.

Submucous resection is, of all current operations on the septum, the most tedious and delicate. This applies to those complicated deviations of the vomero-chondro-ethmoidal variety. Whenever we intend performing Killian's operation, we are beset with inconveniences, one of which, and not the least, being the duration of the operation. Whatever may be the skill of the specialist, there is a minimum of time required to effect a satisfactory result. Including the period devoted to anæsthesia, the operation lasts about three-quarters of an hour, providing that anæsthesia and hæmostasis are as perfect as possible. This procedure is usually carried out in the sitting posture, the head being held by an assistant. But if it be true that the intervention is in many cases unattended with difficulties, we know that, with some patients, we cannot be too considerate. In nervous patients the operation is difficult, interrupted by troubles and protracted. With a view to obviating these conditions operating with the patient in the supine position has been tried. With Clar's mirror (the only one suitable in this case) the various stages of the operation are carried out as in the sitting posture. This method is applicable to all cases of submucous resection, and has been adopted with every satisfaction by Lemaitre, Lubet-Barbon, Chabert, and the author.

Inconveniences of the method :

(1) From a practical standpoint it is open to reproach, as complicating the operation; the best methods demand simplicity. In fact, the procedure assumes the character of a major operation; an operating table is required. The inconvenience is very slight if we limit ourselves to the special cases mentioned, without generalising the method.

(2) It is only possible to operate with a mirror of Clar's type, and therefore the electric current in some form or other is necessary.

(3) Flow of blood into the pharynx. This trouble will be easily avoided if care be taken to tampon thoroughly with a solution of adrenalin 1 in 1000.

The advantages we have observed are: No syncope, the patient is

calmer, and the head is well steadied. This method may be applied to all cases, but, restricted to those which we have mentioned, it seems to offer real advantages.

H. Clayton Fox

Intranasal Treatment of Affections Remote from the Nose—Emil Mayer. "Laryngoscope," 1916, p. 21.

The article deals first with headache, and second the case of a female, aged 21, who had had frontal headache for four weeks. The left middle turbinal pressed on the septum; removal resulted in cure. Nasal headaches are usually referred to an area bounded by the glabella, the external canthus and the anterior nasal spine, though the pain may extend to the teeth, ears, and even the shoulder. In long-continued cases the general health is undermined. In making a diagnosis all the more common causes of headache should be eliminated and the condition of the eyes especially should be investigated. Shrinking of the turbinals by local applications aids in the diagnosis of nasal headache. Only as a last resort should part or the whole of the middle turbinal be removed.

Mayer recalls the work of Sluder and Jonathan Wright on the sphenoidal sinus. These investigators found that the clinical picture in chronic cases of sphenoidal sinusitis arose from narrowing of the bony canals comprising the optic and Vidian nerves. Mayer records the case of a male, aged 21, who was apparently suffering from acromegaly following old fracture of the skull. The left eye was quite blind, and there was temporal hemianopsia on the right side. X-ray examination showed the sella turcica much enlarged. The right ethmoid contained pus, and the temperature ranged from 103° F. to 105° F. Operation on the ethmoidal and sphenoidal sinuses resulted in a fall of temperature and restoration of vision.

Lastly, Mayer deals with nasal dysmenorrhœa, and claims priority in this field for his fellow American, John N. Mackenzie, who, in 1883, described genital spots on the inferior turbinal and the septum. In 1897 Fliess found that these spots swell during menstruation, and that the application of 20 per cent. cocaine relieved the pain of dysmenorrhœa. According to Mayer the inner part of the inferior turbinal and the tubercle of the septum form the genital spots on each side. Mayer uses trichloroacetic acid to cauterise these areas, and states that in a large percentage of cases the relief is permanent. "When actual obstruction occurs, such as deflected septa, enchondroses or hypertrophied mucosa over the turbinals, surgical intervention adds to the certainty of permanent relief."

J. S. Fraser.

EAR.

Results of Auditory Re-education.—G. de Parrell. "Proceedings of the Parisian Society of Laryngology, Otology, and Rhinology," January 10, 1914.

For a year the author had the opportunity of examining and observing large numbers of drug subjects treated by the electrophonoid acoustic method. The following are some conclusions arrived at:

(1) The anacoustic method in the majority of cases gives results far superior to those obtained up to the present by the classical methods.

The degree of improvement is very variable, and never reaches the *restitutio ad integrum*, save in some cases of juvenile sclerosis.

(2) Treatment of deafness by the anaoustic method is physiological in character, not anatomical, that is to say, that auditory re-education has no action on cases of deafness with atrophy of the labyrinth and auditory nerve, or consecutive to more or less complete destruction of the internal ear or auditory centres. It is absolutely contra-indicated in congenital deaf-mutism, in sudden deafness of syphilitic or meningeal origin, and in the greater number of cases of marked deafness resulting from infectious and toxæmic labyrinthitis (mumps, typhoid, and pneumococcal etc.).

(3) In a general way the improvement observed is in inverse ratio with the age of the patient and the chronicity of the lesion. In practice it is much better not to give a prognosis as to the degree of improvement, one would thus be open to disappointment, as it is impossible to gauge beforehand the reactionary power and excitability of the labyrinth. Nevertheless, when there is paracusis willisii, a commencing sclerous labyrinthitis, recent adhesive otitis or juvenile sclerosis, we may expect a good result.

(4) Deafness from chronic disease demands prolonged treatment, and results are only maintained by repeated acoustic exercises at regular intervals, and more or less frequently according to the degree of loss of hearing. The labyrinth, like every other organ, should be continually exercised in its function on pain of physiological deterioration. It is therefore advisable from time to time to resume the auditory exercises, just as one mobilizes a joint, the seat of ankylosis.

(5) Anaacusis has a distinct influence on the auricular circulation, and consequently on the evolution of adhesive processes or suppurations of the middle ear. The mechanism of these vascular phenomena seems to be the following: Stimulation of vaso-motor nerves under the influence of sonorous vibrations, energetic vaso-dilation, increased blood-supply, and therefore copious flooding of the entire auricular region.

The clinical proof of the existence of these phenomena lies in the reawakening of the glands of the auditory tract (reappearance of cerumen), slight congestion of the manubrial plexus, and rapid cessation of otorrhea (active congestion permitting diapedesis and consequently phagocytosis).

(6) Acoumetry with the watch or tuning-fork has only a very relative value in regard to auditory re-education. The loud voice, and especially the soft voice, alone enable us to make an exact estimate of the progress in hearing. Moreover, as Gradenigo (Turin) has recently stated, "examination with the voice is most in favour with aurists, and is most physiological." The acoumetric value of soft voice, maximum, is insisted upon, for as soon as one exceeds this maximum laryngeal vibrations appear, and it becomes the loud voice. There is therefore every reason to believe that in using this soft voice maximum in the successive tests to which one subjects the patient, one maintains the same degree of intensity, and averts the causes of errors which may happen with the whispered voice, the limits of which are relatively more elastic. However, no error on the part of the experimenter can explain the strides in hearing such as those observed in many re-educated deaf people, which extends, for example for the soft voice, from 4 to 5 m. to 2 and 3 m., and for the loud voice from 50 cm. to 8 to 10 m. Moreover, the patients themselves, and their friends, thoroughly realise the progress made when

having been incapable of hearing for a number of years, they can after treatment hear a play, what is going on at a conference, a telephonic communication, and generally all that concerns them in ordinary life. It is, however, the greatest satisfaction to all of us engaged in combating so painful an infirmity as deafness, to see so many of those who have committed themselves to our care, restored to social life, recover their lost spirits, and express their gratitude in impassioned terms. This consoles us in the difficulties which we are continually meeting, and encourages us for the future.

M. Munch remarked that in a general way one year's experience for a new method was not a prolonged one. It is not sufficient to record satisfactory results at the end of treatment, especially when it concerns re-education of a function as delicate as audition: it is indispensable to keep patients under observation for a long time, so as to insure against error, *e. g.*, declaring as cured or even improved, patients who at the end of a certain period complain of a definite increase of their deafness. Lastly, even if in the future the apparatus championed by Parrot fulfils its promises, deaf subjects will not all resort to auditory re-education. Numerous lesions, such for example as adhesive otitis, will remain amenable to our usual methods, and will be still greatly improved by current forms of treatment, such as passage of bougies, æration of the tympanum, and massage.

H. Clayton Fox.

A Case of Vertigo Shown for Diagnosis.—H. Thursfield. "Proceedings of Royal Society of Medicine." Neurological Section. June, 1916, p. 83.

The case was that of a male, aged forty-nine. His symptoms were giddiness, persistent vomiting, and a tendency to fall backwards, which began five years previously, and had gradually increased in severity. He had no paralysis and no retinal lesion. The left ear was the seat of a labyrinthine deafness.

The labyrinth was completely removed. The patient made an uninterrupted recovery, and the vomiting was entirely relieved.

A left facial palsy followed, which still persists. The giddiness, though improved, is still present, and occasionally he suffers from vomiting. The tendency to fall backwards is also frequently marked. Though on the whole there is considerable improvement, it cannot be said that the operation has abolished his symptoms.

There is no further development which would point to intra-cranial disease.

Archer Ryland.

MISCELLANEOUS.

- (1) **Right Laryngo-hemiplegia following a Góitre Operation.**—(2) **Right Adductor Paresis from Pressure of Enlarged Cervical Glands.**—L. G. Davidson. "The Medical Journal of Australia." June 3, 1916.

CASE 1.—A young woman operated on for exophthalmic góitre in 1914 had immediate loss of voice following operation, and a violent laryngeal spasm was set up when she attempted to swallow fluids. Mirror examination showed complete right laryngo-hemiplegia. The voice was reduced to a whisper at first; afterwards it became husky, feeble, and

unmusical. After eighteen months the voice had greatly improved and the suffocative attacks had ceased. On phonation the sound cord completely closed the glottic chink. A compensatory action of the sound cord made up for the inaction of the paralysed one.

CASE 2.—Adult male. Nothing the matter with voice in ordinary conversation—when he has to shout his voice “breaks” or “cracks.” Both sides of the neck along the borders of the sterno mastoid muscles are occupied by a string of enlarged lymphatic glands, some of them as large as a hen’s egg. The cords adduct well on phonation, but on inspiration the right cord lags behind its fellow, and gets no further than the ladoveric position. Several examinations may be necessary before one can determine an adductor paresis. An adductor paralysis may be present from the pressure of a goître without there being any loss of voice or laryngeal symptoms whatever. This being so, every case of goître should be examined laryngoscopically before and after operation. Cases of enlarged cervical glands also should be examined for adductor paralysis as a matter of routine.

A. J. Brady.

An Excessive Bleeder.—Hurd. “Laryngoscope,” December, 1915, p. 856

The patient was a male, aged twenty-seven. There was no family history of hæmophilia, but the patient had suffered from epistaxis since his fifth year. At the age of six tonsillotomy was performed, but there was no alarming hæmorrhage. At twelve years there was severe bleeding after the removal of teeth and intravenous saline infusion was necessary. Later the patient fell and injured his hip, and this resulted in a large hæmatoma from which 1 lb. of blood-clot was removed. Hurd saw the case on April 28, 1914, and found tonsillitis, deviation of the nasal septum with erosions. *The clotting time of the blood was then normal.* Submucous resection was performed and the packing removed at the end of twenty-four hours without hæmorrhage. Eight days later the tonsils were removed by dissection and snare under ether anaesthesia. Four bleeding points were ligatured in each tonsil fossa. Some hours later the patient vomited blood and morphia was administered. The vomiting continued and the pulse became weak, so the “Murphy drip” was begun and pressure was applied with gauze sponges to both fossæ. As the vomiting continued, morphia was again given and normal horse-serum was injected. Next day the pulse could not be counted and the temperature rose to 103° F. Morphine was again given and also coagulose. May 1: No hæmorrhage. Coagulose again given. May 2: Recurrence of bleeding. Three Michel clips applied. For two days there was no hæmorrhage, but again on May 5 and 6 the trouble recurred, necessitating the insertion of more clips. The last of the clips was only removed one month later.

Hurd states that the case clearly showed that there is another condition that causes excessive bleeding than the demonstrable changes in the blood, which make up the picture of hæmophilia. The patient’s blood clotted promptly, not only in the capillary tube but also in his throat and after entering the stomach. Hurd thinks that there was some fault in the walls of the blood-vessel. The coagulose appeared to have no effect. Prof. Howell examined the patient’s blood on a subsequent occasion and thought it possible that the condition of the blood might vary from time to time. Howell found a low amount of prothrombin and a somewhat high amount of antithrombin in the plasma.

J. S. Fraser.

REVIEWS.

Diseases of the Throat, Nose, and Ear, for Practitioners and Students.

By W. G. PORTER, M.B., B.Sc., F.R.C.S.(Edin.). Second edition.

Revised by P. McBRIDE, M.D.(Edin.), F.R.C.P.(Edin.), F.R.S.E.

Seventy-seven illustrations, forty-four in colour. PP. xvi + 280.

Bristol: John Wright & Sons, Ltd., 1916.

THE second edition of Dr. Porter's little work sustains well the high opinion which we expressed concerning it in 1913. Its author, absent abroad in the service of his country, has been fortunate in securing the services of so eminent a physician as Dr. McBride to revise his second edition. The book now contains reference to suspension laryngoscopy, additions to vestibular reactions, and a number of therapeutic suggestions and pathological observations.

The only criticism that we have to offer is that the remarks upon the causation of deaf-mutism require some modification before they can claim to be an accurate exposition upon the subject.

Dr. Porter's book is one of the most complete and accurate handbooks on the subject that we possess, and reflects great credit upon its author.

Macleod Yearsley.

Oto-Rhino-Laryngologie du Médecin Praticien. Par Dr. GEORGES

LAURENS. Deuxième Edition. 440 pages. Avec 593 figures

dans le texte. Paris: Masson et Cie., 120 Boulevard Saint Germain, 1916. Prix 8 fr.

Among the many things they do better in France, it would seem, we must now include the making of practical handbooks for general practitioners of medicine—that is to say, if this book is any indication of the general run of French manuals. As a matter of fact, however, we suspect the merits to be personal rather than national, for those who are acquainted with Dr. Georges Laurens' "Chirurgie Oto-Rhin-Laryngologique"—the first book on the operative surgery of our special regions ever published—will at once recognise in this compact little handbook the same clearness and cleanness of statement as in the older volume, together with a similarly lavish use of appropriate diagrams. Indeed, so plentiful are the illustrations that by merely "looking at the pictures" it is possible to follow quite closely, and to benefit very fully from, the author's descriptions and instructions. For this reason we go so far as to recommend the book not only to those who can read French, but also to those who cannot. And although it is intended primarily for general practitioners, still we cannot but remark that those of our readers who have any teaching of their special work to carry out will find these diagrams to be most welcome additions to their repertory of class-room and blackboard pictures. A further advantage is that as most of them are simple line drawings they can be copied with great ease. The gift of thus conveying information pictorially is possessed by Dr. Laurens in the highest degree, and a striking example of this singular talent is evident on p. 309 of the book, where three simple figures suffice to tell the whole tale of the opening of a retro-pharyngeal abscess in an infant.

That the book in many directions manifests the defects of its qualities is no more than we should expect to find. It is, to be sure, a little too dogmatic, a little too precise, a little too rigid in its opinions and regula-

tions. But here and there, also, one does feel rather surprised at the advice given. Thus, on p. 321, the practitioner is instructed in a "Rule," with all the emphasis of heavy type, never to employ a tonsillotome, the morcelleur being recommended in its stead. Tonsillectomy receives no mention at all. But all this is merely the way in which the author removes the fear of post-operative hæmorrhage from the troubles that beset the path of the occasional operator!

We commend strongly the author's plan of inserting a section, in the "treatment" of each disease, dealing with "what to avoid," as well as one of "what to do." Among the former, in the case of acute purulent otitis media, we read: "Do not look upon this disease as a simple malady which always gets well of its own accord." And in the same connection we are warned not to "infect the ear with polychromatic mixtures, so-called analgesics and antiseptics," or to prescribe injections before the membrane is ruptured. Moreover, the thoroughly sound and sensible teaching is promulgated to open the membrane early and not to wait until it ruptures spontaneously.

But the book is full of good advice, clearly enunciated, and, as a rule, based upon orthodox and well-tried principles.

We were almost persuaded to be enthusiastic in our praise, but that is merely the effect of the wonderful series of diagrams.

There is no index.

Dan McKenzie.

The Auditory Organ in War Time. By E. J. MOURE and P. PIETRI.
Paris: L. Fournier, 1916.

This pamphlet, reprinted from the *Archives de Médecine et de Pharmacie Militaires* (June and August, 1916), is an elaborate essay divided into two parts. The first deals with "labyrinthism" and functional examination: the second with cerebral deafness, malingering, and exaggeration. The authors point out the necessity of very great care in physical and functional examination and in obtaining every possible information as to original causation, etc. They advocate repeated examinations, static and auditory, of the organ of hearing by the most recent methods, considering such examinations as necessary and even indispensable for the detection of conscious or unconscious aggravations by the patient or to bridge the *lacune* of earlier investigations. The expert otologist will find that in cases of injury of the ear, the importance of the blow, or of the shell shock, is not always in relation with the auditory and static disorders. The authors deprecate undue precipitancy in diagnosis—"Review in six months or a year for a definite opinion" is the rubric upon which they insist.

Macleod Yearsley.

THE LATE DR. JULES BROECKAERT.

In addition to what was intimated in our last issue, we learn that the movement for subscriptions from the Otological and Laryngological Sections of the Royal Society of Medicine was started by Sir Felix Semon, who laid the state of matters before the President of the Section, and at the same time subscribed five guineas.

We understand at the same time that Sir Felix applied to Dr. Emil Mager, of New York, and to Prof. Burger, of Amsterdam, to interest

American and Dutch Oto-laryngologists in the movement. The result has been very gratifying. Dr. Mayer has sent Sir Felix a preliminary subscription of £100, raised among American Oto-laryngologists, under the auspices of the Presidents of the various special societies, with himself as treasurer, with the pleasing intelligence that an equal amount may be expected later.

Prof. Burger has sent the handsome contribution of £116 7s. 9d., coming from the members of the Dutch Oto-laryngological Societies. In addition, the following subscriptions are gratefully acknowledged:

	£	s.	d.
Mr. Chichele Nourse	1	1	0
Dr. J. B. Horgan (Cork)	1	1	0
Dr. W. S. Syme (Glasgow)	2	2	0
Mr. Thos. Guthrie (Liverpool)	2	2	0
Dr. Peter McBride (Edinburgh)	3	3	0
Mr. Marriage (London)	2	2	0

NOTES AND QUERIES.

"MY STEP-CHILD, OTO-LARYNGOLOGY."

One can imagine Madam Medicine using these words to introduce Oto-Laryngology to the world at large on certain State and ceremonial occasions.

To some of our readers the phrase may perhaps sound rather like an echo of "old unhappy far-off things, and battles long ago," as quite a few years have elapsed since even a mild protest has had to be uttered at any neglect of our speciality in general circles.

But it happens now and then that, in spite of all its prominence in the van of the advance-guard of Medicine, Oto-Laryngology has still occasionally to submit to such neglect as would suggest that in the ideas of some of our confrères, even at this time of day and after all we have done, we still must occupy the unhonoured place of a child born to the bar sinister.

Here, for example, we have the last issue for the year that is just gone of our respected contemporary, the *Lancet* (December 30, 1916) in a periscope view of the activities of medicine during 1916, finding room for an account of things done in "Surgery," "Obstetrics and Gynaecology," "Ophthalmology," "Neurology," "Electro-Therapeutics," including also reports from remote corners like "Tropical and Exotic Medicine," but omitting any mention whatever of any work in Oto-Laryngology, save where a brief and passing glance is made, under the heading of "Surgery," at some of Mr. Irwin Moore's new endoscopic instruments.

Even in the allusions to shell-shock there is no suggestion that the voice or the hearing is ever affected.

Is it because no progress has been made in our speciality during the year? Or is it possible that the "Twilight Sleep" of the Obstetric Section has extended the range of its activities and has fallen upon the Oto-Laryngological correspondent of the *Lancet*?

Or is it simply that Oto-Laryngology was forgotten?

At all events we venture to express the hope, now that attention has been directed to it, that the omission will be made good by another year. And in the meantime we can, without displaying any undue conceit, advise all who desire to learn what progress our speciality has made in 1916 to consult the files of the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY.—D. M.

THE LATE SIR THOMAS SMITH, OF BART.'S.

The following anecdotes of Tom Smith are culled from a number of others told by Mr. Gerard Smith, M.R.C.S., in the *St. Bartholomew's Hospital Journal* for January, 1917:

He had no reverence for drugs. I remember him calling to (then) Dr. Lauder Brunton in the Hospital Square: "I say, Brunton, I want you to give me a drug to inhibit a patient's vaso-motor what's-his-name!" On another occasion he asked me to write him a prescription for a gargle for his private patients. I did so. Some days later he met me in the Square and said: "I say, my covey, that gargle dissolves all my patients' teeth; write me another!"

"The tonsils, gentlemen, by the will of a beneficent providence, have the function of earning fees for surgeons," was a dictum of Tom Smith's.

THE PRESCRIBING OF COCAINE.

By an amending Order dated December 5th, 1916, some amendments have been made in the Defence of the Realm Regulation 40 B relating to cocaine and opium, of which the following are the most important: (1) Power is given to the Secretary of State to issue licences for the manufacture of cocaine in this country. Any person manufacturing or carrying on any process in the manufacture of cocaine without a licence or otherwise than in accordance with the conditions of the licence will be liable to a penalty. (2) A medical practitioner who gives a prescription for the supply of cocaine otherwise than in accordance with the conditions laid down in the Regulation is made liable to a penalty. (3) Every article containing cocaine must be marked with the amount and percentage of cocaine contained in it. (4) Power is given to the Secretary of State to direct that any person authorised under the Regulation to purchase cocaine or opium who is convicted of an offence against the Regulation or against the Proclamations regulating the import or export of cocaine or opium shall cease to be an "authorised person." (5) The authorisation in the case of registered chemists and druggists is limited to persons, firms, or bodies corporate who carry on the retail business of a chemist or druggist. The expression "authorised person" includes a duly qualified medical practitioner, a registered dentist, and a registered veterinary surgeon.

One symptom of pancreatic disease, quite as curious as that of diastase, is this. You know that in a few people if you drop a 1 in 1000 solution of adrenalin into the eye the pupil will dilate. The extraordinary thing has been noted that it often happens when the patient has pancreatic disease.—DR. HALE WHITE.

BOOKS RECEIVED.

- Nordisk Tidskrift för Oto-Rhino-Laryngologi. Stockholm. 1916.
Band i, nr. 2, 3, och 4.
L'Organe de l'Audition pendant la Guerre. By E. J. Moure & P. Pietri. Paris: L. Tournier. 1916.
Oto-Rhino-Laryngologie du Médecin Praticien. Deuxième Edition. Par Dr. Georges Laurens. Avec 593 figures dans le texte. Masson et Cie., 120, Boulevard St. Germain, Paris. 1916.

THE
JOURNAL OF LARYNGOLOGY,
RHINOLOGY AND OTOTOLOGY.

Original Articles are accepted on the condition that they have not previously been published elsewhere.

If reprints are required it is requested that this be stated when the article is first forwarded to this Journal. Such reprints will be charged to the author.

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**UNILATERAL BLINDNESS, ASSOCIATED WITH CYSTIC
DISTENSION OF THE MAXILLARY ANTRUM OF THE
SAME SIDE.**

BY G. H. POOLEY, B.A.(CANTAB.), F.R.C.S.(ENG.), AND
G. WILKINSON, M.B.(CANTAB.), F.R.C.S.(ENG.).

In the *Ophthalmic Review* for May, 1913, we recorded the first published case of this condition. The following is a brief note of a second case which has come under our joint notice.

HISTORY AND PROGRESS OF EYE SYMPTOMS, BY MR. POOLEY.

A. H.—, pitbankman, aged forty, was sent to me by Dr. Garrett, of Worksop, on January 4, 1916. He complained of failing sight of the right eye for the last three weeks.

Vision :

Right eye less than $\frac{6}{60}$. No improvement with glasses.

Left eye with + 0.5 = $\frac{6}{12}$.

Right eye: Pupil inactive to light directly; reacts consensually. On examination, the right disc is pale in appearance with striate edges, and is swollen $1\frac{1}{2}$ diopters. The left disc is almost, if not quite, normal. The Wassermann reaction was negative. He had some bad teeth, but said that he had had no trouble with his nose.

February 16.—He is now an in-patient at the Sheffield Royal Infirmary. His right optic disc is white and the vessels small, and there is less swelling of the disc. The left disc is rather pale. The Wassermann reaction has been tested again, and is negative.

March 1.—Mr. Wilkinson has examined him. He reports a distension of the right maxillary antrum, and has performed an operation for the relief of this condition.

March 14.—Right, less than $\frac{6}{60}$. Left, less than $\frac{6}{60}$. The right disc is now quite pale, but the left appears to be normal.

March 28.—Vision of right eye less than $\frac{6}{60}$. Left, $\frac{6}{18}$.

April 11.—Vision as March 28.

On April 19, Mr. Wilkinson performed a further operation for removal of bone presumably pressing on the right optic nerve.

May 2.—Vision of left eye, $\frac{5}{6}$ partly.

May 23.—Vision: Right, counts fingers. Left, $\frac{5}{6}$ partly.

June 30.—Vision: Right, hand movements, no perception of colours. Left, $\frac{5}{6}$.

July 18.—Vision: Right, counts fingers. Left, $\frac{5}{6}$ partly.

This is a case of considerable interest on account of the rarity of the condition. There is only one other published case, that of Mrs. P——, reported by us in the *Ophthalmic Review*.

In the present case there was some optic neuritis, and, unfortunately, owing to the man living at some distance from Sheffield, and to the great demand for beds at the Sheffield Royal Infirmary at the time, some four or five weeks were lost before a detailed examination of the patient's nose and throat could be made. During that time the case had advanced very rapidly to optic atrophy. In Mrs. P——'s case the condition was detected before any optic neuritis had developed.

It is difficult to understand why the vision of the left eye should have been affected. It improved somewhat slowly after the first operation, and more rapidly after the second one, and is now normal. The roof of the distended antrum could hardly press on the left optic nerve, and the clear contents of the antrum should not have been toxic.

NASAL CONDITION, AND REMARKS BY MR. WILKINSON.

He was first seen on February 22. There had then been failure of sight of the right eye for two months. No displacement of the eye, either outwards or forwards, was detected. Nothing abnormal was detected on examination of the nasal fossæ. There was no pus, or polypi, or sign of any inflammatory condition. Both antra and frontal sinuses transilluminated well. Insufflation of the sphenoidal sinuses showed them to be quite dry. In contrast to the transillumination findings, a skiagram showed comparative opacity of the right antrum. The antra were punctured through the inferior meatuses, and a flow of straw-coloured fluid was obtained from the right. In quantity it amounted to about 3 drms.

March 1.—The right antrum was opened in the canine fossa. A delicate, thin-walled, collapsed cyst was found attached to the outer wall close to the floor, and in the neighbourhood of its attachment there was a patch of swollen mucous membrane. The cavity of the antrum was found to be quite smooth, and enlarged upwards into the region of the anterior ethmoid cells. It was difficult to form an opinion as to whether the floor of the orbit was raised, but the bone here showed no signs of absorption. There was no bulging of the outer or inner antral walls. The cyst was removed, and a large hole made into the inferior meatus of the right nasal fossa for drainage.

As will be seen from Dr. Pooley's notes, the operation was not followed by any improvement of vision of the right eye. On the

other hand, there was a sudden and disconcerting failure of the left eye. Fortunately, this proved to be quite temporary, which suggests that it was induced in some way by the traumatism of the operation, but I am quite unable to offer any explanation as to the nature of the lesion. In view of the absence of improvement in the right eye I performed a second operation on April 19, with the object of relieving any possible pressure on the optic nerve.

The antrum was re-opened in the canine fossa, and the roof was removed so far back as the junction with the posterior angle, with the chisel and forceps. The posterior ethmoid cells were opened up. There was no pus or fluid in them. No improvement of vision in the right eye followed.

The following is a brief abstract of the case published by the writers in the *Ophthalmic Review* for May, 1913:

Mrs. P——, a married woman, aged thirty, was seen by Mr. Pooley on April 22, 1912. She reported that the sight of the left eye had entirely gone five days previously. Sight was dim when she waked in the morning, and the visual field became darkened from below upwards as the day advanced. It was "as though a dark blind had been drawn from below upwards, in front of the eye." When examined the left eye was found to be quite blind, and the pupil insensitive to light. There had been no pain in the eye, face, or forehead. The right eye was normal. Her nose was examined by Mr. Wilkinson on April 24. Nothing abnormal was found in the nasal fossa. The left antrum was slightly duller to transillumination than the right. On puncture, straw-coloured fluid was withdrawn. Vision began to return within half an hour. The antrum was opened the same evening, and a collapsed cystic polypus was removed from its floor. A large opening was made in the inferior meatus for drainage. The eye rapidly recovered its vision, and by May 20 she could read $\frac{4}{5}$ Snellen.

The second case here recorded was in no way so satisfactory or so instructive as that of Mrs. P——, previously published. The onset of the symptoms was much less acute and striking, and consequently a considerable period elapsed before the case came under observation and treatment. Some delay also occurred owing to the difficulty in finding bed accommodation. Optic atrophy had already commenced before treatment was begun, and practically no improvement of vision has resulted. Nevertheless, the fact that a second case has come under our observation in three years is of interest, as it points to the conclusion that the condition may not be so uncommon as the silence of medical literature on the subject would indicate. An analysis of the literature bearing on the case was appended to our report of Case 1 in the *Ophthalmic Review*. It may be summed in by the statement that, whilst optic neurites from infective sinusitis are of extremely common occurrence, such a condition, due to uncomplicated antral disease (either infective or mechanical distension), is extremely rare; and

further, pressure symptoms on the optic nerve, the result of simple distension of any of the sinuses, apart from suppuration, are rare. The following are the only cases we have found in which optic neuritis followed simple (non-suppurative) distension of a nasal sinus.

Hajek (*Wiener klin. Wochensch.*, No. 47, 1909, and *Monatssch. für Ohren.*, Heft, No. 3, 1910), hydrops of the left sphenoidal sinus causing total blindness of the left eye, which recovered after opening the sinus. It is interesting to note that improvement of sight began half an hour after the fluid was let out.

Hirsch (*Prager med. Wochensch.*, No. 50, 1910, and *Semon's Centralbl.*, vol. xii, 1911, p. 404.)—Case 1.—A man, aged fifty-eight, with hydrops of the left antrum, frontal, and ethmoid sinuses, had advanced double optic atrophy. Case 2.—Hydrops of the right frontal sinus caused proptosis and optic neuritis.

Fullerton (*Brit. Med. Journ.*, April, 1902).—Three cases of mucocele. Two cases had slight optic neuritis. The distension affected the ethmoid cells.

Benjamin (*Franke's Archiv.*, Bd. 24, Heft 3, 1911, *cp.* Semon's *Centralbl.*, vol. ii, 1911, p. 344).—A case of mucocele of the sphenoid sinus in which vision was impaired.

The contrast in the result of treatment in the first and second cases illustrate very clearly the importance of early recognition and treatment before permanent changes in the optic nerve have supervened.

With regard to the mechanism of the pressure on the optic nerve in cystic dilatation of the antrum, the history of the onset of the symptoms in the first case is interesting. The visual field was darkened from below upwards, *i. e.* the optic nerve was pressed on from above downwards. The explanation of this sequence of events would appear to be that the floor of the orbit being raised the nerve was pulled upon and stretched over the somewhat sharp upper margin of the optic foramen, the upper fibres being subjected to the earliest stress, which rapidly implicated the whole nerve.

The subject of cystic polypus of the antrum is of great interest. The generally received opinion seems to be that these cysts are degeneration cysts, such as are commonly found in all nasal polypi. Undoubtedly a larger proportion of antral polypi are cystic as compared with ordinary nasal polypi, and the cystic degeneration in the former is commonly more advanced, *i. e.* the antral polypus is frequently nothing more than a thin-walled sac containing straw-coloured fluid. I ventured to make the suggestion in the

report of Case 1, that the poorer vascular supply of the antral mucous membrane as compared to that of the nose might favour degenerative changes in polypi growing from the former. Possibly, the large free cavity in which the polypi are formed, and the suction action of the respiratory currents on the antral contents would also tend to cause rapid distension of the cavity when once formed, by favouring transudation of serous fluid into it from the vessels. These cystic polypi commonly protrude themselves from the antral ostium, and appear in the naso-pharynx as the commonest form of "Choanal polypi." Presumably, they can only cause distension of the antrum when the ostia of the antrum are unusually small, or closed. Distension of the antrum from the presence of a cystic polypus must be a somewhat rare condition.

Kub¹ analysed thirty-six collected cases of choanal polypus. Twenty-seven were antral, three sphenoidal, and six of undiagnosed origin. He states that antrochoanal polypi usually occur as the result of chronic maxillary sinusitis, and that they are mostly cystic. He gives their site of origin in order of frequency as the posterior, inferior, median, lateral, and upper wall.

In both the cases here recorded the polypi grew from close to the floor of the antrum. Otitis of the underlying bone, due to dental caries, might possibly have been the exciting cause. In both cases the mucous membrane was somewhat swollen around the pedicle of the polypus, and in the first case a second small polypus, containing a small degeneration space, had formed close to the pedicle of the first.

LATERAL SINUS DISEASE; INFECTION OF MENINGEAL SPACES; RECOVERY.

By ARCHER RYLAND, CAPT., R.A.M.C.,

Aural Surgeon, Cambridge Hospital, Aldershot.

PTE. G— was admitted to the Cambridge Hospital, Aldershot, suffering from chronic suppurative otitis media of the left ear of five months' duration. In the course of this disease he developed acute mastoiditis.

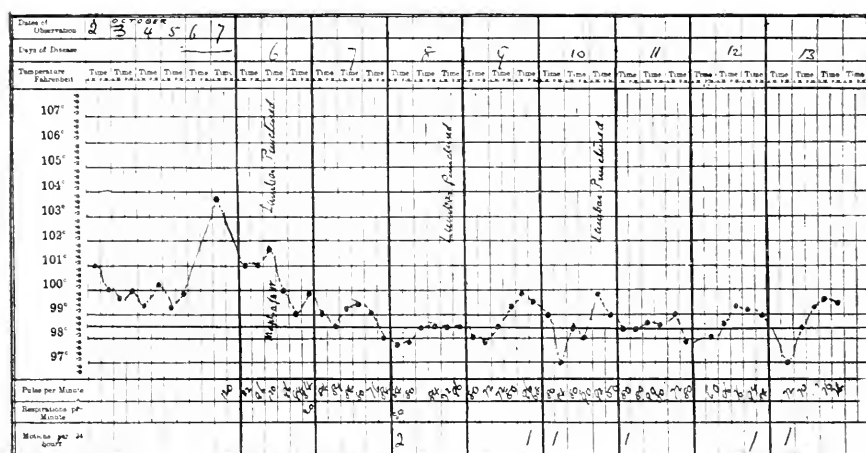
September 1.—Operation revealed the following conditions in the middle ear. There was diffuse osteitis of the mastoid process. The bone was soft and crumbling, very vascular, and of the pneumatic type. There was no actual pus in the mastoid cells, but the cell linings were red and inflamed.

¹ Semon's "Centralblatt," vol. xxix, p. 574.

The radical mastoid operation was performed. The ossicles were found to be necrosed. A few drops of pus were evacuated from the lateral sinus groove. There were purulent deposits on the wall of the lateral sinus. The bone of the tegmen antri and tympani was soft and diseased. An inadvertent exposure of the dura mater of the middle cerebral fossa showed that membrane to be healthy.

The lateral sinus wall was exposed along the length of half an inch. There were no appreciable signs of intra-sinus clot, and therefore no exploration of the lumen itself was carried out.

The conditions therefore were: (1) Diffuse osteitis of the



mastoid process and cells. (2) Persinus abscess. (3) Phlebitis of lateral sinus wall. (4) The appearances were not in favour of an intra-sinus clot.

The following periodic notes record the subsequent progress of the case:

September 16.—All acute signs have disappeared. Convalescence has been, so far, normal except for the temperature, which since the operation has shown a daily rise to 100° F.

September 28.—The local condition is progressing, but not so rapidly as it should, and the antro-tympanic cavity is still very septic. During the last twelve days the temperature has not risen above 99° F.

October 6.—Since September 29 the temperature has again risen, almost every day, to 101° F., and this evening there was a rise to 104° F. The patient has vomited frequently during last

night and this morning. He has marked head retraction, stiffness of the legs, and Kernig's sign is present. There are no ocular signs or facial twitching. The leucocytes number 19,000 per c.mm. Lumbar puncture yielded a fluid, turbid, and under increased pressure.

Pathologist's report on fluid: "The specimen contains no pus cells. At all events, I can find none after prolonged centrifugalisation. There is very little deposit at all, and what there is consists of mononuclear cells, viz. lymphocytes and a few endothelial cells. There are no organisms in the stained smear."

Subsequent to lumbar puncture, the temperature dropped in twenty-four hours from 104° F. to normal, and the pulse rate from 120 to 84.

October 8.—Temperature normal. Pulse 84. Lumbar puncture was repeated to-day as a precautionary measure. The fluid was found to be still under increased pressure. It presented a naked eye turbidity, but of less degree than the former specimen.

With regard to this specimen the pathologist reported as follows: "The second specimen of cerebro-spinal fluid has yielded a good growth of streptococci."

October 10.—Lumbar puncture performed for the third and last time.

October 14.—The temperature has settled to normal.

November 13.—For the last month the temperature has not been raised above normal, and progress has been altogether satisfactory.

The section of the chart which shows the effect of the lumbar puncture is figured.

SOCIETIES' PROCEEDINGS.

ROYAL SOCIETY OF MEDICINE—LARYNGOLOGICAL SECTION.

November 3, 1916.

President: T. MARK HOVELL, F.R.C.S.ED.

Presidential Address.—T. Mark Hovell (see JOURN. OF LARYNGOL., RHINOL., AND OTOL., January, 1917, p. 1).

Cases and Specimens illustrating Work on Atrophic Rhinitis (Ozæna) and Tuberculosis.—Dan McKenzie, John Mackeith, and Wyatt Wingrave.—For a full account of the work done and conclu-

sions arrived at members are referred to the articles which appeared in the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, May, June, and July, 1916.

(I) CASES OF ATROPHIC RHINITIS TREATED WITH TUBERCULIN.

JOHN MACKETH.

CASE 1.—Patient, a female, aged twenty-one (A. P——). Has had atrophic rhinitis of several years' duration, subsequent to cortical mastoid operation. Has had course of tuberculin treatment, from January to September, 1913. In addition to the improvement in the condition of the nose, hearing has greatly improved.

CASE 2.—Patient, a female, aged twenty-three (F. K——). Has had atrophic rhinitis for about twelve years. Mother died of phthisis, also an aunt. Had course of tuberculin treatment, October, 1914, to June, 1915. In addition to the improvement in the condition of the nose she does not have "colds" as she used to do.

CASE 3.—Patient, a male, aged thirteen and a half (B. T——). Had course of tuberculin treatment, March, 1913, to February, 1914, which was followed by violent reactions. No history of tuberculosis in his family. Had enlarged gland (tubercle ?) of neck.

CASE 4.—Patient, a female, aged thirteen (M. F——). Mother died of phthisis. Had four courses of tuberculin treatment: (a) July, 1912, to February, 1913; (b) June, 1913, to August, 1913; (c) October, 1913, to December, 1913; (d) March, 1914, to July, 1914.

CASE 5.—Patient, a female, aged twenty-four (M. S——). Tubercle bacilli in sputum, May, 1913. No tubercle bacilli in sputum, March, 1914. Had a course of tuberculin treatment, May, 1913, to January, 1914.

Charts and records of the cases are shown.

Mr. Macketh was solely responsible for the management of these cases during the treatment by tuberculin.

(II) CASES OF ATROPHIC RHINITIS (OZENA) IN SISTERS; ACID-FAST BACILLI ABSENT; WASSERMANN REACTION POSITIVE.

DAN MCKENZIE.

CASE 1.—R. A——, aged twenty-two. Typical appearances of ozena. Acid-fast bacilli were not found either in the nasal crusts or in the sputum. Wassermann reaction positive.

CASE 2.—F. A——, aged twenty. Conditions similar to those of the first patient, whose sister she is.

Since the appearance of the above-mentioned papers fifteen unselected cases of atrophic rhinitis of different types have been examined, with special reference to the acid-fast bacillus—crusts and discharges from the nose being sent to Dr. Wingrave. Of these fifteen cases the acid-fast bacillus was found to be present in eight and absent in seven. Of the seven *negative* cases, two were post-operative cases with very mild nasal phenomena. In three the Wassermann reaction was positive—these include the cases now exhibited. In two, although they presented the clinical appearances of typical ozena, no evidence either of tubercle or of syphilis could be found. All eight *positive* cases were diagnosed clinically as ozena. Two were children, aged seven and eight, respectively, the youngest patients we have so far seen. Another

interesting case was that of a girl, aged thirteen, the tuberculous family taint appearing in her mother, who was a patient at the Central London Throat and Ear Hospital with lupus of the nose. A maternal aunt and a sister of the girl had died of phthisis. In the nose of this patient there was very little crust deposit, but the factor was unmistakable. Attention is directed to the negative cases in which the Wassermann reaction proved positive. This finding may be compared with that formerly reported, in which a partial positive Wassermann reaction was found in a patient who responded negatively to all the tests for tuberculosis.¹

(III) SPECIMENS OF ATROPHIC RHINITIS (OZENA).

EXHIBITED BY WYATT WINGRAVE.

(1) Acid-fast films prepared direct from ozena crusts: (a) Coarse type: (b) slender type. Stained by (a) fuchsin and methyl green: (b) fuchsin and picric acid.

(2) Reinforced clumps.

(3) Growth on Dorset egg and fetid broth medium.

(4) Sections of gland from inoculated guinea-pigs. "Tubercle" bacilli *in situ*. Stained by orthodox Ziehl-Neelsen (alcohol).

(5) Typical examples of discharge, or ozena crusts (macroscopic).

Histological Changes.—Alterations in the nasal mucous membrane are not so profound as one would expect. The early or exudative stage, when the discharge is fairly abundant and somewhat "creamy," is not attended by any striking histological feature beyond a distinct increase of the lymphoid and vascular elements. Later, however, when atrophy and fœtor are pronounced, there is decided shrinkage in the whole mucous membrane. Lymphocytic and endothelial infiltration of the glands is now replaced by atrophy of the acini and general fibroplastic tissue, all structures—nerves included—sharing the general atrophy. But the most striking feature is metaplasia of the surface epithelium. The columnar and ciliated cells are entirely replaced by many layers of stratified squames which often block the ducts. These changes extend by continuity to the accessory sinuses, the naso-pharynx, the larynx, and even the trachea, but they never pass beyond the muco-cutaneous junction. Ulceration or necrosis never occurs, and bone is never attacked. In this respect it differs entirely from lupus, although it somewhat closely resembles lupus erythematosus, with which it has been found in conjunction. Giant cell systems are never seen.

The Discharge.—In early stages it is somewhat free and contains plenty of mucin, but never resembles pus. So that, even at this early period, it cannot be called "purulent." Later on it becomes more and more scanty, loses its mucin, and can only be detached with difficulty. Its dark colour may be due to anthracosis or to various chromogenic bacteria, and its degree will vary with its retention *in situ*. Chemically the lipoids predominate, with cell globulin and keratin granules, much being derived from the metaplastic epithelium, which shows the characteristic acid-fast reaction of epidermal cells. For diagnostic purposes, small portions of the green crusts should be spread with normal saline solution on slides, which are then firmly pressed together and separated by sliding. Fixing may be wet or dry. If the fixing is by heat, this should be radiant, and not exceed 40° C., otherwise the bacilli swell up

¹ JOURN. OF LARYNGOL., RHINOL., AND OTOL., May, 1916, p. 184.

and become deformed. Weak formal alcohol is preferable, which should be well rinsed with water. Stain by carbol fuchsin on a hot plate for at least ten minutes, wash in 25 per cent. sulphuric acid, and counterstain with saturated solution of picric acid in water, or if other structures are to be shown use 1 per cent. methyl green in preference to methylene blue. Both of these stains are preferable to the orthodox Ziehl-Neelsen, since they afford much better differentiation. The films cannot be too thin. These stains will show the "acid-fasts" brilliantly retaining the fuchsin. Other films should also be stained in the same way, but no alcohol should be used after the acid bath. They should have at least three washings with acid. Many of the "acid-fasts" will be found to be alcohol-fast as well, even so far as to be "colour true," *i. e.* they will not take up the counterstain. The picro-fuchsin is the more precise process. A great variety of bacteria, chiefly saprophytes, will usually be seen, but for the present purpose the acid-fasts only demand description. In a well-advanced case the acid-fast will at once be seen, in earlier cases they may require some patience. They are somewhat polymorphic, being long or short, thick or thin, solitary or fasciculated, straight or bent, but nearly always "beaded"—*i. e.* not uniform in staining. In size and general appearance they strongly resemble both types of tubercle bacilli and in some films no difference can be found. Much of the variation in thickness is due to the fixing and staining; if heated too much they will swell up like rice or pop-corn, assuming various fantastic shapes: some may be distinctly "clubbed." Tintorially and morphologically, they therefore closely resemble tubercle bacilli, which also are not infrequently amphophile to the Ziehl-Neelsen stain, and but feebly alcohol-fast.

Cultivation.—So far they have resisted the orthodox methods, either aerobic or anaerobic, but by imitating their natural habits they multiplied slowly but freely, growing in felted masses resembling streptothrix. A sterile emulsion was first made from fetid crusts, this was then mixed with Dorset egg medium and "planted" with crust material. Reinforcement by simply inoculating the "crusts" or by adding a few drops of sterile fetid broth is generally successful in from five to ten days.

Inoculation Tests.—By the courtesy of the Lister Institute several series of guinea-pigs and rabbits have been inoculated. The research is far from complete and is being continued. The results so far obtained are, briefly, as follow: In September, 1915, Dr. Henderson Smith injected six guinea-pigs with a reinforced emulsion (five days) made from a typical case of ozæna. No. 1 died during the sixth week, showing well-marked tuberculosis of the spleen. The five surviving apparently healthy guinea pigs were killed during the tenth week. No. 2 revealed extensive caseation of liver, spleen, retroperitoneal and inguinal glands. No. 3 showed well-marked caseation of the inguinal glands, but the viscera were apparently unaffected. Nos. 4, 5, and 6 appeared to be quite healthy. Nos. 1, 2, and 3 were injected subcutaneously, Nos. 4, 5, and 6 intraperitoneally. Histological examination of the caseated foci showed characteristic tubercular lesions, there being giant cell systems with true tubercle bacilli, both intra- and extracellular. The bacilli were strongly alcohol-fast and of the slender type. Dr. Henderson Smith reported: "The smears from the spleen nodules and the glands both showed acid-fast bacilli very like tubercle. I have very little doubt they are tubercle. I was interested to find that you obtained

histological tubercle in the sections." Emulsions were then made from the tuberculous viscera of Nos. 2 and 3, with which three guinea-pigs were inoculated on the day of the necropsy. No. 1 died in the eighth week, No. 2 died at the twelfth week, both showing extensive gland caseation with "bacilli both acid and alcohol-fast, obviously tubercular." Guinea-pig No. 3 was mislaid. Nos. 1 and 2 were injected subcutaneously, No. 3 intraperitoneally. In each group of tests those injected beneath the skin-developed lesions, while the animal injected intraperitoneally escaped. There were no pulmonary lesions in any one of them, nor could any intranasal change be found. Excluding one animal which was lost, *five out of eight developed lesions which were indistinguishable from tubercle*. In each test the strictest precautions were taken against contamination at every step, from collection of the material at the hospital to the final necropsy.

A stage has therefore been reached which must not be considered conclusive, although collectively the evidence may be viewed as strongly presumptive. It has been established that certain organisms, morphologically and tinctorially resembling tubercle bacilli, are present in ozæna which we have never found in any other nasal disorder.

Mr. HERBERT TILLEY: We should not allow this occasion to pass without expressing our thanks and congratulations to Dr. McKenzie, Mr. Mackeith, and Dr. Wingrave for the excellent piece of work which they have done in connection with the relationship between atrophic rhinitis and tubercle. Probably most of us have read their monograph which was published in the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, and since then, when dealing with cases of atrophic rhinitis, have laid more stress on getting all the details of the family history from the point of view of tubercle. In many cases I have been surprised to find such a history in the forbears. The question, however, has arisen in my mind whether, if we were to investigate the family history of any one of us here, we should not be able to find some relative who had had tubercle. But I think the percentage in cases of atrophic rhinitis would be greater than in any other form of nasal disease. I have carefully examined the cases exhibited to-day, and, with the exception of the little girl—who has not had many injections, and would scarcely yet be claimed as a success—the nasal cavities seemed to be in a very good condition. Presuming that they have had no other treatment, the result of the tuberculin injections has been, on the whole, better than in the other methods we have been in the habit of using. Perhaps it is as yet too early to speak of what the ultimate result is likely to be; but whatever may be the result, whether positive or negative, I cannot withhold my admiration for the useful work which these gentlemen have done.

Dr. WATSON-WILLIAMS: I should like to add my thanks for the monumental investigation which has been undertaken by Dr. McKenzie, Mr. Mackeith, and Dr. Wingrave. It requires a great deal of enterprise to start an investigation on this subject nowadays, which has been the cemetery of many laborious hours; and we can only hope that their conclusions, which certainly seem warranted, will prove to be justified. No one has taught us more than has Dr. McKenzie himself to be very cautious in arriving at conclusions, and I think we cannot read these papers without feeling that they are the product of balanced minds. Dr. McKenzie has at least given us food for reflection, and has gone a long way towards leading up to some conclusive evidence in the

treatment of the disease, the *bête noir* of laryngology. He has so far carried me with him in his way of thinking that I shall give his methods a careful trial.

Dr. DUNDAS GRANT: I also feel very strongly, with those who have already spoken, that we have had here an honest endeavour to get further towards the truth of the conditions known as ozæna and atrophic rhinitis. A weak point in the work lies in the fact that Dr. McKenzie has taken the terms "ozæna" and "atrophic rhinitis" as identical. Ozæna without the peculiar smell is scarcely worthy of that name. Ozæna does certainly occur in subjects of pulmonary tuberculosis, though seldom; whereas chronic atrophic rhinitis with crusts, dryness, and pus, is common. If you put the two together under the heading of ozæna for statistical purposes, the result will be to invest ozæna as such with a degree of anxiety for the unfortunate sufferers from it which, I think, is not justified. I would remind you that for years the French have spoken paradoxically of an ozæna without smell, and they assert that, as a rule, "ozæna without smell" is generally tuberculous. It is probably lupoid in character, and might react to tuberculin. Apart from that, the results which have been obtained in the cases before us are worthy of every consideration. I should be glad if members would express their opinions as to whether ozæna and chronic atrophic rhinitis should be classed together for the purpose of drawing statistical deductions of either pathological or clinical import.

Mr. F. A. ROSE: I should also like to congratulate Dr. McKenzie and his colleagues on this excellent piece of work. I also want to ask a question. I am not clear, after reading the notes, whether it is claimed that these acid-fast bacilli are in the tissues of the nose, or only in the secretion inside the nose.

Dr. DAN MCKENZIE: I pointed out in my paper that we have never yet succeeded in finding these bacilli in the tissues of the nose.

Mr. F. A. ROSE: Assuming that the bacilli are present in the secretions only, is it not possible that they are there only by accident? A nose which is the subject of atrophic rhinitis is one which cannot protect itself from infection, so that all the bacilli in the dust in the streets may be deposited there. And if the patient only lives among enough acid-fast bacilli, there is no reason why those should not be found in the nasal secretions. We know that if a careful search be made for diphtheroid bacilli they are found in 90 per cent. of cases of atrophic rhinitis; and it is impossible not to find streptococci, staphylococci, *Micrococcus catarrhalis*, and other organisms. The question is, What relation have these bacteria to the disease?

Dr. JOHNSON HORNE (commenting on the statement in the paper, "It has been established that certain organisms, morphologically and tinctorially resembling tubercle bacilli, are present in ozæna which we have never found in any other nasal disorder") said: If I may be permitted, I would refer my listeners to the "Descriptive Catalogue of the Museum of the British Congress on Tuberculosis," held in London in July, 1901. On that occasion I was fortunate in bringing together a representative collection of cultures of bacilli, acid-resisting and morphologically and tinctorially resembling the tubercle bacillus. Amongst these was one isolated by Karlinski (Maglaj, Bosnia) from nasal secretion. Perhaps Dr. Wingrave will tell us whether the bacillus to which he refers has not been isolated before, or whether it

is perhaps the same one which was isolated some years ago from the nose. The case for tuberculosis will stand or fall on the animal experiments, but they are, as the authors admit, far from complete, and must not be considered conclusive. Even a negative result will be valuable in elucidating the facts about ozæna. The question is whether this acid-resisting bacillus is merely an accessory to the crusts and discharge or whether it is a factor in the production of the disease. I am inclined to the former view.

Sir STCLAIR THOMSON: All research work is to be admired, even when the results are negative. I am not qualified to join in this debate, because I also have, so far, neglected to read these communications *in extenso*. But of the cases I saw in the next room none were free from suppuration, and more than one had the ozanaceous odour. In connection with tubercle I do not know whether it is of value to this debate, but I have had exceptional opportunities of seeing cases of tubercle, and for some years I have interested myself in a clinical research which I hope to publish some day: I mean the condition of the nose and pharynx in persons who have, or have not, tubercle of the larynx. I have quoted that there is a sort of *a priori* statement that the patient with stenosis of the nose, or other trouble in his nose or in the pharynx, is more likely to get tubercle, and tubercle of his larynx, than is anybody else. I see the throats of 300 tuberculous patients per annum, and I have been doing that for five years, and the result has been, to my surprise, that patients with tuberculosis of the chest or the larynx have got no more marked nasal deformity from disease than has the healthy individual, and that such affections of the nose as sinusitis or ozæna are no more common in sanatoria than they are anywhere else.

Dr. BROWN KELLY: I think we are indebted to Dr. McKenzie and his co-workers for so thoroughly investigating the nature and treatment of ozæna, our ignorance of which is not creditable. I regret that my own work on behalf of the International Collective Investigation of Ozæna has apparently come to nought. The only part which proved of practical benefit was that in connection with the employment of a vaccine of Peréz's bacillus. This vaccine is undoubtedly specific in some cases; it causes the factor to pass off, the nose to discharge more freely, and the crusts to disappear. Some of the cases which I treated in 1913-14 still remain cured. Peréz's bacillus can be produced by injecting a mixed culture of ozæna crusts into the marginal vein of the ear of the rabbit. The animal usually dies in a day, and the bacillus can be recovered from the turbinates. If the animal survive, it has a chronic nasal discharge, and if it be killed later, the anterior turbinate is atrophied.

Dr. D. R. PATERSON: I have also taken part in a collective investigation into ozæna, and have received a definite impression of a connection in family histories between tubercle and ozæna. I examined a large number of school children, confining my attention to cases in which the characteristic smell existed, and was struck by the frequency of the association. I have long noted the liability of ozæna patients to perish of tuberculosis.

Dr. DONELAN: Would it not be well for the Section to avoid using the term ozæna in cases where there is not the characteristic smell? Should we not speak of ozæna simply as a symptom occurring in atrophic rhinitis, or are we to run the risk of having it cropping up

at every moment as an alternative disease? I understand we are dealing with atrophic rhinitis. Whether it be due to the bacillus as worked out by these investigators, or not, remains to be seen. Several of the cases shown to-day seemed to be at least secreting, if not actually suppurating, and one woman has the distinct ozænic symptom, and appeared to have some suppuration in the left sphenoidal sinus.

Dr. DAN MCKENZIE (in reply): On behalf of my fellow workers and myself, I thank those who have spoken for the very kindly way in which they have treated our attempt at research. The criticisms which have been expressed we not only expected, but have actually experienced in our own minds. I began this research with the idea that I should arrive at a negative finding. When I began I thought there was only an accidental connection between tuberculosis and ozæna. As time went on, however, my experience brought me round to the belief that there is a real connection between atrophic rhinitis and tuberculosis. And when I use the words "atrophic rhinitis" in connection with this research, I mean ozænatous or fœtid atrophic rhinitis. The items in detail have been dealt with in our papers and there is no need to recapitulate the grounds for our belief. We are so convinced by our experience that we say we are content to leave the results of our research to time: we believe that in fifteen to twenty years general opinion will agree that ozæna is associated with tuberculosis in this respect, that they are part and parcel of one pathological process, that they are related as pathological entities. With regard to the point raised by Mr. Rose, as to those bacilli found in the crusts being due to accidental contamination from the air, that is answered by the fact that we have searched for this bacillus in other diseases with crust-formation and have not found it in them. It only occurs, as far as we have gone, in those which show the clinical signs of ozæna.

Three Cases exemplifying some likely Common Causes of Cancer of the Throat, and some Facts about Treatment by Diathermy.—W. Stuart-Low.—CASE 1.—A man, aged fifty-two, who had been before this Section on two former occasions with a rapidly growing epithelioma of the soft palate. It began mid-way between the uvula and the base of the anterior faucial pillar, and rapidly, and superficially, spread to the uvula and middle line, and appeared so unusual that experienced observers mistook it for a syphilitic condition. When first seen in February, 1915, the growth was only the size of a sixpenny piece, then it rapidly involved the anterior faucial pillar and uvula. Dr. Wyatt Wingrave pronounced the specimen removed to be a rapidly growing epithelioma. Pain had been very severe from early in the history of the case, and hard glands at the angle of the jaw also appeared early and caused an unusual degree of pain. The history of syphilis was proved, and the Wasserman test was positive. At our meeting in March attention was drawn to his habit of drinking scalding hot coffee. When he first came to the hospital his mouth was in a very septic state from septic gingivitis, dental caries, and pyorrhœa alveolaris. The chemical reaction of the fluids in the mouth and throat were distinctly acid. Dentition was defective. He had always taken a large quantity of common salt with his meals, and been a very heavy smoker. Two weeks ago all the uvula and palpably affected tissue were dissected away under a general anæsthetic, laryngotomy first having been performed and the

larynx firmly plugged. The diathermy cautery was then freely applied to the surface of the exposed tissues, and punctures made into the freshly exposed parts at various spots. The method of diathermy puncture of malignant glands, first practised by myself, was then employed, viz. the hard mass of the glands having been exposed by freely reflecting the soft structures, the diathermy point was pressed into the glands repeatedly at various points, and the skin replaced and stitched up. Healing by first intention invariably resulted as in this instance.

CASE 2.—A man, aged fifty-four, a railway guard at Basingstoke, was sent to the clinic a month ago. He only complained of increasing inconvenience in the throat and of some difficulty in swallowing. Pain was almost absent except at night, and there were no enlarged glands to be felt. The growth had affected the whole of the soft palate, which was largely destroyed, and what remained was sloughy and craggy when touched by the finger. It had also extended to the tonsillar region on both sides. The implication of the palate was very similar to that in the case just described, but the absence of pain and glandular involvement was in marked contrast. Wassermann's reaction was found to be positive, and there was a clear history of syphilis. He had always been a heavy smoker, often consuming 1 oz. of tobacco a day. The mouth was very septic from badly cleaned teeth, septic gingivitis, and large accumulations of septic tartar. The saliva was very acid. There were many carious teeth and dentition was defective, and he had always taken quantities of common salt with his food, and been fond of hot food. Three weeks ago laryngotomy was performed, and the larynx plugged, and the whole of the affected parts cut away: the tonsils which were affected being dissected out. Diathermy puncture was freely applied to the surface of the wound, and the point pressed into any parts that felt unusually resistant or firm on examination with the finger. A week later the diathermy puncture was again applied to a few sloughy looking parts. Dr. Wyatt Wingrave found the growth to be a rapidly growing variety, and a specimen is exhibited under the microscope. It is peculiar in showing many large glands in its structure.

CASE 3.—A man, aged forty-five, who came to the clinic last May, complaining of increasing difficulty in breathing: the history was that he had been affected and under treatment for six months previously. A large mass of fungating growth, which proved to be epitheliomatous, was seen to be implicating the right vocal cord and ventricular band. A low tracheotomy was performed. He was found to have a positive Wassermann reaction. He had a very septic mouth with acid reaction, and he had smoked a great deal. Diathermy puncture has been done, the laryngeal growth having been punctured regularly at intervals of a week both by the direct method and in the suspension position.

Diathermy has been proved to be very helpful in these cases and in a number of others in which it has been employed. It undoubtedly relieves the pain both internally in the throat and in the neck and head after puncture of the masses of glands by the method I introduced. It seems to be best to repeat the application at intervals of a few days, and not to apply it at any one time too extensively or severely. The growth is not only destroyed in places, but grows more slowly at the deeper sites where cure is not effected nor possible. Diathermy should be employed as early as possible in the history of such cases. In more advanced cases sloughy portions of the tumour are got rid of after the

puncture, and in this way fœtor is lessened and sepsis of the mouth and throat diminished.

As regards contributory causes of cancer, syphilis has been present in every case that the exhibitor has investigated. Sepsis of the mouth, generally in an aggravated form, has invariably existed, and the saliva has been found to be quite acid in reaction, and excess of common salt has mostly been taken. Dental deficiency seems also to be a contributory cause, leading to the food being improperly masticated, and thus irritating or wounding the pharynx. It has also been noticed that these patients accustom themselves to taking very hot food.

Dr. WILLIAM HILL: The results are very good. But we see the cases rather early, and it is desirable we should see them later as well. I have had some experience with diathermy, thanks to the work which has been done at St. Bartholomew's Hospital, and it seems to be very useful. But the plan of dealing with glands is not one upon which I have embarked, and I ask whether it is worth while to diathermise the glands, as Mr. Stuart-Low has done: I have only carried this out in my cases to relieve pain. I think it is better for the patient after these extensive excisions, he is more comfortable, and the scarring is not so great. But you must be prepared for tumefaction of the pharynx and trachea, although Mr. Harmer said he did not meet with this condition, which is one that may necessitate temporary tracheotomy. It is well to remember that in diathermy a little more tissue is always destroyed than is apparent at the time.

Mr. NORMAN PATTERSON: I think that in this case treatment of the glands by ordinary surgical methods would have been eminently satisfactory. It was not an inoperable case and removal by dissection was preferable to applying a cautery.

Mr. STUART-LOW (in reply): It is a method which I use after employing the knife first. By that means one is enabled to see exactly what one has done, and little harm is likely to result from the diathermy.

A Braun's Artificial Larynx worn by a patient for Five and Three-quarter Years in a Case of Laryngo-fissure for Epithelioma, followed by Complete Excision of the Larynx.—Sir StClair Thomson.—The patient, J. S. P.—, was aged forty-three when he came under my observation in February, 1909. The record of his medical history is as follows: 1909—February 25, laryngo-fissure; May, stenosis started in glottis; November 28, tracheotomy; December 6, incision of larynx; 1915—November 5, gland in neck; 1916—August 18, died. N.B.—No local recurrence.¹

Mr. E. D. D. DAVIS: I should like to ask whether members have had experience of Braun's tube. I have a patient of Major Waggett's under my care, who has worn a Braun's tube for about seven years, and he complains that saliva escapes into his trachea, causing violent attacks of coughing, so that the passage between the trachea and the pharynx is a disadvantage, and he has several times asked to have it closed. He speaks in a toneless whisper, which it is difficult for a stranger to understand, and speaking is laborious for him. The history of the case is interesting. In 1903 Sir Felix Semon did a laryngo-fissure. There was a recurrence in six weeks. Major Waggett and Mr. Stabb did a second and extensive laryngo-fissure three months after the first operation. He did well until 1907, and then Major Waggett

¹ Case published in full in the *Brit. Med. Journ.*, February 17, 1912.

and Mr. Stabb performed a laryngectomy, and he has worn a Braun's tube ever since. The result is very encouraging.

Sir STCLAIR THOMSON (in reply): The patient was able to breathe both through his mouth and through his neck, so he obtained a double supply of air. Indeed he was able to bicycle. When sitting at home and not wanting so much air, he put the stopper in his neck, and so had a good rough whisper speech. This tube also enabled him to enjoy a smoke. He did not complain of the tube leaking, and he lived a useful and happy life for five and a half years. The question of recurrence is important. I did laryngo-fissure in February. The patient was getting some stenosis in his glottis by May. Sir Henry Butlin saw the case in consultation, and he could not make up his mind. But by November the man had such a degree of stenosis that I had to do tracheotomy in a hurry. Sir Henry Butlin saw him again, and said: "Take out the whole larynx." I took it out, and the man did well. But when the larynx was examined pathologically, there was no evidence of malignant recurrence. (This was before the days of the Wassermann test. Later we found that the patient was an old syphilitic subject.) I still have the larynx, if any further investigations are required. This was a great blow to me, because tracheotomy would probably have done just as well. Sir Henry Butlin told me not to worry, as the man was probably much better without his larynx. Now, it is to be noted that five and a half years later this patient came back for cancer in the glands of the neck, in spite of excision of the larynx. But there was no recurrence in the throat. To his last day he breathed comfortably, dying of asthenia owing to recurrence in the glands of the neck. People who are not versed in laryngo-fissure say: "If a man has malignant disease at all in his larynx, take out his whole larynx." But here is a man who had his larynx taken out in very good time, yet that did not prevent recurrence five and a half years afterwards. Laryngo-fissure, in suitable cases, gives better results in cancer than any other operation; and the case shows that even a complete laryngectomy is not an infallible guarantee against recurrence.

War Injury of the Nose to show the Result of Treatment for Stenosis caused by a Bullet Wound.—Sir StClair Thomson.—Capt. C. R. V. J.—received a bullet wound in January, 1915, which penetrated the nose from the right to the left side. When he came under observation fourteen days later there was almost complete stenosis from adhesions between the septum and outer wall in each nasal chamber. It was also clear that the patient had a very deviated septum. On August 19, under chloroform, I performed a resection of the septum, which was very irregular, having evidently been comminuted by the bullet. Several pieces of cartilage were replaced, as has been my custom for many years. The adhesions were then divided, and rubber sponge plugs introduced. There has been some tendency to scar contraction, chiefly on the floor and roof, which is so common in the nose and larynx after these war injuries. This has been corrected by the persevering use of Lake's rubber splints, which the patient is still wearing.

War Injury of the Nose to show Result of Treatment for External Disfigurement and Stenosis caused by Shrapnel Wound.—Sir StClair Thomson.—Lieut. F. H. B.—, aged twenty-one. On May 17, 1915, while in a trench at Givenchy, a shrapnel burst over him

and wounded him in the nose. I was asked to see him in consultation at the Chichester Hospital in June, 1915. The wound on the external nose had been so badly put together in France that the result was an unsightly disfigurement, as is well shown in the two photographs exhibited. There was no respiration through the left nostril, and the right was so occluded with adhesions that it admitted only a fine probe. In addition, the shrapnel had produced a condition like hare-lip, and a fracture of the superior maxilla. I suggested a plastic operation to Dr. D. Ewart, of Chichester, and a photograph, as well as the patient's present condition, will show how very admirably he carried out this delicate piece of surgery. The patient was transferred to my care in London in January, 1916. As the nasal respiration, although improved, was still unsatisfactory, the adhesions were divided under chloroform, and I found the septum so fairly plumb that it was left alone. Since then he has been persevering with the use of Lake's rubber splints, with the result that he has now a good thoroughfare, although there is still the usual tendency in these cases to some return of cicatricial stenosis.

Dr. DAN MCKENZIE: I suggest diathermy in treatment of these adhesions. Has anyone tried to graft the interior of the nose in these cases?

Dr. BROWN KELLY: I have seen five or six cases in which a bullet traversed the bony bridge of the nose without causing trouble. In others, however, in which the projectile traversed the lower part of the nose, almost hopeless damage resulted, owing to the inferior turbinates and septum being united. If these cases are not seen within ten days of being wounded, thick synechia form. I think that is one of the reasons why there should be rhinologists at the Front.

Dr. DUNDAS GRANT: The plan of treatment is so good, and it is so easily carried out in a number of cases, that there is scarcely any call for improvement upon it. After doing the submucous resection of part of it, I find ordinary cotton-wool smeared with vaseline is good, and better still is a little indiarubber finger-stall put upon the blades of a Killian's long nasal speculum, pushed through and packed with gauze. It can be pulled out without the slightest discomfort.

Mr. HERBERT TILLEY: I should like to ask Sir StClair Thomson what are his reasons for preferring Lake's rubber splints. I have given them up for the past seven or eight years, because patients complained of neuralgia when these splints were used. I have since employed thin celluloid plates which cause no discomfort; they also leave room for nasal breathing, and prevent the opposing parts coming into contact. If the rubber splints are used because they are thicker, and give support, I would suggest the use of a gauze wick wrapped round with oil silk; they can be made of a size to fit the part, mould themselves to the surroundings, and can be removed without any pain.

Dr. PEGLER: Those who can look back far enough will remember that what is called a Lake's splint was a later invention, and that for some years previously he used indiarubber sheeting, cut to required shape, and adapting thickness and size to suit the particular case. I employed them very successfully in a case of a soldier whom I showed early last session, who had had very bad traumatic stenosis, and had required two or three operations for its relief. If Mr. Tilley has had to complain of neuralgia in his cases, it is probably because there was a want of due proportion between the passage desired to be kept open, and

the size, particularly the thickness of the splint. The adaptation must be perfect, neither too tight nor too loose; never loose enough to work back into the naso-pharynx. How my *confrères* manage to cure synechiaæ cases requiring lengthened treatment without such a splint of rubber I do not know. Lake's ready-made article, though occasionally one may find a size and shape adaptable to a special case, has never appealed to me, and I therefore make a point of keeping a stock of sheeting of various thicknesses by me, and cutting out the kind of thing I happen to require at the time.

MR. J. F. O'MALLEY: It is necessary to leave in the substance used for ten days. I do not cut through with scissors, but get in Grünwald's forceps as wide as the nasal passage which is clear of the nasal synechiaæ, and in that way one establishes the complete width of the nasal passages as they existed before, and then one applies a piece of rubber which is loosely fitting. (Dr. PEGLER: We all use Grünwald's forceps.) I avoid using a local anæsthetic previously, so as to ensure that one is dealing with the actual size of the nose.

Dr. WILLIAM HILL: Captain Hastings has contrived ingenious devices for these cases; he has made large use of ordinary hairpins with thin indiarubber tubing, attaching them to the forehead. This prevents depression of the nose. I have been much impressed by the delicate work he has done in preventing deformity from both the tip and the bridge of the nose falling in. But there may be deficiencies which have to be supplemented by plastic flaps. Mr. Hern, dentist to the same hospital, has also some ingenious devices.

Dr. DONELAN: I should like to support what Dr. Pegler has said about indiarubber sheeting. For many years I have used it of the thickness of surgical gloves; in fact, in the hospital we use up old surgical gloves for this purpose. In treating synechiaæ one can pack it exactly as wanted. Mr. O'Malley's suggestion of taking out the adhesion entirely with the forceps is an important element in the treatment. If you put in rubber sheeting, and pack nicely with gauze, the clearance is maintained; in two or three days you can take out the dressing and put in a fresh one, and so maintain the separation as long as necessary during healing.

SIR STCLAIR THOMSON (in reply): With regard to the cosmetic result in the second case, Dr. Ewart, of Chichester, is responsible for it. The patient was wounded at Loos, and his nose was put back on to his face so badly that he was almost hideous. He was engaged to be married, and his fiancée begged the hospital staff to take away some of the ugliness, and you can see in the photograph how excellent a result Dr. Ewart has achieved. With regard to the stenosis, the bullet went through high up, and much of the stenosis occurred at the top. There was a constant tendency to closure at the top, and I used Lake's splints simply because I was brought up on them! I have used a celluloid plate, but that was when the adhesions were *vis-à-vis*—one on the septum and one on the turbinals—and it was only necessary to keep the surfaces apart. I agree that Lake's splints are rather unpleasant—one patient has had to wear it since January, and the other a year. One patient had a splint made out of aluminium, and it acted admirably.

Large Choanal Polypus removed through the Mouth in a Case of Suppuration of the Right Maxillary Antrum.—Sir StClair Thomson.—This large growth was removed on October 25, 1916. The

patient had noticed a polypus in her right nose for the last ten years, and it had been twice operated upon, under chloroform. The polypoid mass blocked up the right nostril, and hung down into the post-nasal space, below the level of the soft palate. It was plucked out through the mouth. The ethmoidal region appeared normal. The cause of previous failures is doubtless due to the fact that the right antrum had not been operated on. I found it full of fœtid pus.

Dr. IRWIN MOORE: At the meetings of the Section, on May 7 and November 5, 1915, I reported in detail the case of a "Choanal Polypus originating in the Right Maxillary Antrum of a man aged forty-two."¹ Since the post-nasal portion of this polypus was fixed by inflammatory adhesions to the choanal margin, it was impossible to grasp and remove it by forceps, or snare through the nasopharynx. I therefore opened the antrum through the canine fossa, and removed with forceps first the pedicle, which was soft and necrotic, next the nasal portion through the anterior naris, whilst the projecting nasopharyngeal portion was removed through the mouth. This case supports the view first suggested by Killian that the maxillary antrum is nearly always the seat of origin of these polypi: also it shows that these growths may be subject to inflammatory and necrotic changes.

Dr. D. R. PATERSON: How young are the patients in which such cases occur? A fortnight ago I saw a child, aged five, who was very ill with a large bulging swelling in the nasopharynx, and it was said to have been there only three weeks. Before touching it, as the breathing was much impeded when the patient was under a general anæsthetic, I did a tracheotomy, and then attacked it. I found it was fairly firm, and on puncturing it with a syringe I got nothing out of it. I passed up a post-nasal forceps, and twisted it out. It turned out to be a large nasopharyngeal polyp, originating in left nostril, but the parents seemed positive that there had been no symptoms of nasal obstruction until about three weeks previously. That it had been growing a long time was evident from the pressure effect on the left posterior naris, which was much enlarged.

Dr. BROWN KELLY: These polypi, which I think should be called naso-antral polypi, are common. If a polypus is present in the posterior part of the middle meatus, and, on snaring it, there is a discharge of translucent liquid from the nose, it is almost certainly a naso-antral polypus. These polypi are usually single: they may attain so great a size as to hang down into the pharynx: and they occur in children, as Dr. Paterson has said. With very rare exceptions, polypi in children under the age of ten come from the antrum. On removing these naso-antral polypi, no bleeding-point can be seen in the nose which would indicate their seat of origin. A misleading feature is that transillumination shows the antrum on the affected side to be brighter than on the presumably healthy side. Cysts of the lining membrane of the antrum are often associated with accessory ostia, and it is through one of these that the polypus escapes from the antrum.

Mr. FRANK A. ROSE: In answer to Dr. Paterson, I would confirm Dr. Brown Kelly's remarks. In my experience, a polypus in a small child is invariably single, and of the antro-choanal type. One exception to this occurred in a patient aged nine. With regard to the results of transilluminating the antra, the one on the affected side is frequently

¹ JOURN. OF LARYNGOL., RHINOL., AND OTOL., vol. xxxi, p. 53.

brighter than the other. I had the curiosity to take a patient back, after the removal of the polypus, and transilluminate again; the antrum was then dark, on account of the blood which was escaping from the root filling the antrum.

Sir STCLAIR THOMPSON (in reply): I am glad to have originated this discussion, because we have Dr. Brown Kelly here, and when I wrote the chapter in my book on this subject it was chiefly founded on his work and publications. I should have liked to have asked him and the other speakers whether it is necessary to do an operation on the antrum in these cases. This patient had fetor and pus, and of course I did an endo-nasal operation. I have removed these growths from children, in whom I do not know whether there has been recurrence or not. (Mr. ROSE: Recurrence, in my experience, is uncommon.) I think there is no need to operate on the antrum unless it is diseased, or unless there is recurrence.

Foreign Body in the Right Maxillary Antrum for Twenty-five Years causing Facial Neuralgia, discovered by X Rays and removed by Operation through the Canine Fossa.—Irwin Moore.

—Patient, a lady, aged sixty-seven, was brought to me by Mr. Millican, L.D.S., of Surbiton, with a history of facial neuralgia for twenty-five years. While residing in the West Indies in 1891 she had a right upper molar extracted; this was followed by very severe pain under the right eye, from which she has never been entirely free. In 1897 she had a nervous breakdown, and a "lump" was said to have been felt over the right maxillary antrum, accompanied by much pain and tenderness. In consequence the remaining upper molars were extracted. In 1901 the patient came to England and consulted a throat specialist, without any benefit. She returned to the West Indies, seldom free from pain, with occasional exacerbations. In 1911 she went to New York, and had the right infra-orbital nerve resected. In 1913, while residing at Bexhill, following another acute attack of pain she noticed that the "lump" was loose and moved about. Recently she has been treated by means of alcoholic injections. In September, 1916, she consulted Mr. Millican, who extracted the two upper central incisors which were loose and septic, and took her to Mr. Charles A. Clark to be X-rayed. The radiogram showed a foreign body in the right maxillary antrum lying against the nasal wall. It appeared to be cylindrical in shape, about 1 in. in length and $\frac{1}{2}$ in. in diameter.

On October 12 I was asked to see the patient in consultation. There was no history of nasal catarrh or suppuration, and both nares were found to be perfectly healthy and normal. On inspecting the radiogram it was apparent that a rod-shaped body was present in the right maxillary antrum, and I advised that the antrum should be opened and a search made for the foreign body. Two days later I opened the antrum through the canine fossa and found the piece of aluminium now shown lying loose in the angle formed by the meeting of the posterior and inner walls. The lining membrane of the antrum was found to be perfectly healthy. The foreign body was cylindrical in shape, and consisted of pure aluminium, having a length of 1.34 cm. = 0.113 in. (just over $\frac{1}{2}$ in. in length), and a diameter of 0.29 cm. = 0.175 in. The specific gravity was 2.666 and the weight was 0.24 grm. = 3.69 grains. One extremity was smooth, whilst the other appeared to have been cut by pliers. This piece of metal had

apparently been buried or fixed for twenty-five years, and (as suggested by the patient's symptoms) only became loose and movable in the antrum three years ago.

This case is of great interest as showing that: (1) The maxillary antrum will tolerate a foreign body for twenty-five years without causing catarrh or suppuration, the usual accompaniment of foreign bodies in these cavities. (2) The shadow of this rod-shaped body could be distinctly seen when the antrum was transilluminated. (3) The appearance of the aluminium foreign body (according to the opinion of expert radiographers) was not compatible with its being metal. (4) Cases of facial neuralgia may be treated for years without any suspicion of being caused by antrum trouble. (5) The progress which has been made during recent years in radiography has proved of great service in the diagnosis and treatment of diseases of the accessory sinuses of the nose.

A stereoscopic view of the maxillary antrum by Mr. Charles A. Clark is shown, also the piece of metal removed.

Mr. P. MILLICAN (introduced by Dr. Irwin Moore): The trouble started after the patient had had her first right upper molar removed by an American practitioner twenty-five years ago. She has very large antra, and I believe that the anterior buccal root of that molar was in intimate relation with the antrum—possibly it projected into it. It is my opinion that, having discovered that he had made a passage into the antrum, the practitioner attempted to plug the socket with a piece of aluminium rod. This rod he found to be longer than was necessary, so he snipped off the excess with pliers while it was in her mouth—the mark of the pliers may be distinctly seen on the aluminium rod taken from her antrum by operation. This piece of rod escaped from his reach, passed into the antrum, and remained embedded there for twenty-five years. I should like to add (what is useful to note) that the patient suffered periodically two kinds of pain: one of a stabbing nature caused by the sharp ends of the foreign body irritating the mucous membrane of the antrum, and the other a "lump sensation," the site of which was variable.

Sarcoma of the Right Maxillary Antrum; Lateral Rhinotomy performed (Moore's Operation).—Irwin Moore.—Patient, a female, aged fifty, was first seen on July 14, when she complained of swelling of the right cheek for six months, accompanied by considerable mucopurulent discharge from the right nostril. There was marked bulging outwards and upwards of the right maxillary antrum, some displacement of the right eye, and œdema of the lower lid. The right nasal cavity was completely filled with polypi.

Transillumination showed the right maxillary antrum to be opaque. X-ray examination by Dr. Finzi also showed that it was opaque, its upper outline ill-defined, and the bone at its upper part partly absorbed. The right sphenoidal sinus was absolutely clear (though it looked rather dark, this being due to a shadow across the cavity.) Both ethmoids also appeared clear. Patient declined operation, but on account of the swelling increasing she was admitted to hospital on September 18, when a lateral rhinotomy was performed.

The growth, which appeared to have arisen from the right ethmoid region, occupied the greater part of the antrum, had penetrated its bony wall, and extended into the soft parts of the cheek, but had not yet

infiltrated the skin. The floor of the orbit was intact, though somewhat roughened. The growth was thoroughly removed, together with the ethmoid cells and a portion of the muscular tissue of the cheek. There was no difficulty in controlling the hæmorrhage, and the skin incision was sutured and dressed with strips of gauze and collodion. Healing occurred by first intention, the stitches being removed in four days. The œdema of the lower eyelid has not yet quite cleared up. The nose (now six weeks after operation) appears quite clean and healthy, and here is no discharge.

Microscopical Report.—The sections show dense masses of a round-celled tissue with a fibrous stroma. The cells vary in size, some of them are large, all possess large nuclei rich in chromatin. The growth is a small round-celled sarcoma, for several of the sections, evidently taken from the tissues outside the antrum, show striated muscle which is undergoing destructive infiltration by masses and lines of the round-celled tissue (Dr. Eastes' laboratory).

Radiograms by Dr. Finzi are shown, together with microscopic sections of the growth. The photographs show the swelling of the right cheek on July 7 and the increase in the growth during the following two months.

Dr. W. HILL: In cases of doubt I recommend radium; in nine cases out of ten it acts like a charm.

Sir STCLAIR THOMSON: Recurrence can be best judged from the nose. It is a great thing to make a free opening into the nose. In cases like the two I published, in which the patients lived five and six years afterwards, you can pass the Eustachian catheter into the cavity and feel how it is lined with smooth mucous membrane. Interference with lymphatics leaves patients with a pseudo-œdema on the lower eyelid for three to twelve months, so it does not do to judge of recurrence by the outside appearance. Radium can be introduced to the original site, which is generally the ethmoid.

Retention Cyst of the Nasal Floor.—**Irwin Moore.**—Patient, a male, aged fifty-three, first seen on September 12, 1916, complained of a growth on the right side of the nose and the adjoining portion of the cheek. The case is shown previous to removal by sublabial rhinotomy (Rouge's operation). Photographs and radiogram are also shown.

Note.—This case unfortunately could not be shown at the meeting, for while attending the dental department of one of the general hospitals to have some septic teeth removed before operation, the cyst was incised by the dental surgeon. Patient is now attending the hospital daily to have a gauze dressing inserted. Exhibitor hopes to show the case at another meeting, if and when the cyst refills.

Carcinoma of the Naso-pharynx removed by Operation.—**Irwin Moore.**—Patient, a female, aged seventy, attended the London Throat Hospital on July 5, 1916, complaining of frequent attacks of inflammation of the throat for six months, together with dryness of the tongue. Three weeks previously she had felt discomfort in the throat, "as if there was something there," and on taking a deep breath she noticed a swelling behind the soft palate. On retracting the palate on the left side an irregular nodular growth was seen, which was of hard consistence and was attached by a broad base to the lower margin of the Eustachian cushion and lateral wall of the naso-pharynx. Under

an anæsthetic it was found impossible to draw a wire snare round the growth on account of its wide attachment, so it was removed in pieces by punch forceps, partly through the nose and partly through the mouth, patient being in the "hanging head position."

Patient now complains of shooting pains reaching from the left side of the back to the top of head. The left tonsil is seen to be enlarged, somewhat congested, and feels hard on palpation. This was, however, noticed the day following the operation, and does not appear to have increased in size. No enlarged glands in the neck can be felt, but the question of recurrence in the tonsil is a point on which opinions are invited.

Histological Report of the Growth.—The specimen consists to some extent of lymphoid tissue, but this is invaded by a new growth having the structure of a carcinoma. The cancer cells are rounded and arranged in compact solid masses of varying size infiltrating the tissues. There is a good deal of associated inflammatory reaction (Dr. Eastes' laboratory). Microscopical sections are shown.

A drawing from life is exhibited, showing the growth before operation.

Dr. BROWN KELLY: I would suggest a trial of radium in cases of malignant disease in the naso-pharynx. Dr. James Adam and I have published cases of very striking disappearance of growth after radium treatment.¹

Dr. W. HILL: At the Radium Institute a good deal is effected by means of small needles. Radium is introduced through the nostril and embedded in the growth and then passed behind. In one or two cases I have put it into the palate. The next day one may find the growth has disappeared over an area of $\frac{1}{2}$ in. from the needle. I had a patient who was sent me by Mr. Horsford, and I wanted to send the case back after a couple of days that he might see it again, but there was no growth. Two or three days later there was evidence of scarring, even in the nose itself. It was an endothelioma, and extended to the level of the epiglottis. The usual result in carcinoma is not good.

Dr. IRWIN MOORE: I ask whether members think there is a recurrence of the growth in the left tonsil. The question is, whether this should be dealt with now, and enucleated.

Cystic Goitre.—Irwin Moore.—Patient, aged thirty-nine. Enlargement of the thyroid began thirteen years ago during her first pregnancy. A year later she underwent an operation at the Metropolitan Hospital. Seven months ago the swelling recurred, and is now growing rapidly. She has occasional shortness of breath, otherwise no other disturbance.

Fatal Wounds involving the Carotid Vessels and presenting Unusual Features.—H. Lawson Whale.—CASE 1.—Private S— was admitted to No. 13 Stationary Hospital on July 13, 1916, with a shrapnel bullet wound at the junction of the free margin of the right ala nasi and the cheek; there was no exit wound. Instantly on his admission there was a copious hæmorrhage from the mouth, from behind the palate. On inspection it was impossible to say from which side of the naso-pharynx the blood came. Since, moreover, a probe showed that the direction of the bullet was towards the left mastoid, responsibility could not be fixed on the branches of one carotid more

¹ See JOURN. OF LARYNGOL., RHINOL., AND OTOL., vol. xxxi, pp. 345, 346.

than on those of the other. Pressure on the common carotid, however, was much more successful in controlling the gush when made on the right side, so the right external carotid was tied forthwith just above the origin of the superior thyroid. His condition being too grave to warrant his transfer to the X-ray room, he was carried straight back to bed as soon as I had tied the artery, so that we were even yet ignorant of the position of the bullet. Within six hours he developed complete *right* hemiplegia, and without showing any reaction to stimulants, etc., passed through coma to death twenty hours after his arrival.

Autopsy: The bullet had passed through both antra, and the nose, and then deeply to the left vertical ramus of the mandible. On impinging on the anterior surface of the left mastoid the intact shrapnel bullet had turned downwards deeply to the carotid sheath, and was lying exactly in the bifurcation of the common carotid. The common and external carotids were normal, but, from its origin up to the base of the skull, the internal carotid was completely thrombosed. This thrombus was continued into the left half of the circle of Willis, and into the middle cerebral artery as far as this could be traced up the Sylvian fissure. There was a subpial layer of red cortical staining over the Rolandic area. The necropsy showed nothing else noteworthy. On the right side the external carotid and its branches above the superior thyroid were naturally collapsed.

CASE 2.—Sergeant W—— was admitted to No. 13 Stationary Hospital on July 16, 1916, with a shrapnel entrance wound 1 in. external to the left nostril, and an exit wound in the left sub-occipital triangle. The bullet had traversed the left antrum and mastoid. The skiagram gave no useful information. He had left facial paresis of infranuclear type, cerebro-spinal otorrhœa, and fine horizontal nystagmus of the first degree on deviation to the left. He had no giddiness, vomiting, ataxia, atonia, or dysdiadokokinesis. His superficial reflexes were sluggish. A slight diffuse swelling occupied the parotid and temporal regions. Hearing, by air or bone conduction, was absent on the left; temperature, etc., were normal. Ordinary cleansing and expectant measures were instituted. July 18: The temporal œdema had subsided, that over the parotid was harder, and was continued down the anterior border of the sternomastoid as a brawny mass. His pulse was 110, temperature 105° F., with a rigor, and four hours later 103·8° F., with another rigor. The pupils were equal, sluggishly reacting to light; and at no time now or subsequently did the fundi oculi show anything abnormal. July 19: Operation. Through the ordinary post-aural incision the outer shell of the mastoid (which was found cracked) was removed. The bullet in passing had smashed the facial "bridge," with the rest of the bony posterior meatal wall. The lateral sinus was laid bare with the chisel; no perisinous pus was found, but the sinus wall was hard, pulseless, covered with shreddy granulations, and nearly black. Bone was cut away backwards until healthy sinus was reached (1½ in.), and downwards to the bulb. The insertion of a needle showed that the thrombus was only mural, not complete; and before putting gauze plugs between the dura and skull behind, and into the sigmoid sinus itself (which was slit open for this purpose), blood was allowed to flow for a few seconds. The internal jugular and common facial veins were tied in the neck. I did not turn out the clot between the ligature and the bulb. Subsequent history: For ten days there was a gradually diminishing

flow of cerebro-spinal fluid from the wound, the external auditory meatus, and into the mouth (? *via* the Eustachian tube). Besides ordinary dressings, etc., he was given Wright's antiseptic vaccine and champagne. The cerebro-spinal flow and the nystagmus slowly disappeared, and in all respects he steadily improved. But on July 26 the temperature and pulse became irregular, and his condition suggested septicæmia. A blood culture was made, and an autogenous vaccine of streptococci prepared from it. August 1: Hæmorrhage from the lowest angle of the post-aural wound, apparently from deeply in the parotid region. The patient only lost 4 oz. of blood, and the flow was easily stopped by pressure; but his pulse became thready, and he died within an hour.

Autopsy.—The lateral sinus was occluded back to the torcular. The straight, occipital, and superior longitudinal sinuses were healthy. The bulbar opening of the inferior petrosal sinus was well occluded. Brain: There was slight bruising of the *right* cerebellum and temporo-sphenoidal lobe (? by *contre-coup*). The wounds, both bullet and operative, were quite clean. The heart was much infiltrated with fat. The bullet, in traversing the left parotid gland, had completely severed the external carotid artery at the point of its final division into superficial temporal and internal maxillary. This hole in the artery was clean-cut, and from it there was a blood track up to the post-aural wound.

Comment.—There was never any indication that the bullet had involved any large artery. The clean and complete severance of the vessel, the track of the bullet, and the absence of macroscopic sepsis, made it clear to all who saw the necropsy carried out that this was not a case of secondary ulceration, but of direct trauma. I do not know whether the patient's life would have been saved if I had tied the artery when I tied the vein. Probably not, since he had a blood infection.

Carcinoma of Naso-pharynx in a Girl, aged Seventeen.—**W. M. Mollison.**—F. C.—, aged seventeen. A hard mass of glands in the left side of the neck; fixed, occasionally painful and tender. The tonsils and adenoids were removed at a London hospital six months ago. She was seen at Guy's Hospital in October, 1916. A small mass was seen in the naso-pharynx, chiefly on the left side. This was removed mostly through the nose, but partly with an adenoid curette. To the naked eye the mass resembled simple adenoids, but section proved it to be a squamous-celled carcinoma (Dr. Nicholson). A section is shown.

Laryngeal Case for Diagnosis.—**W. M. Mollison.**—A. B.—, aged thirty-five, has been attending in the throat and ear department at Guy's Hospital for some months: he is hoarse and complains of a little pain at times. The left side of the larynx is swollen and fixed: the mesial surface of the swelling is superficially ulcerated. The Wassermann reaction has been negative at two examinations. No tubercle bacilli have been found in the sputum on repeated examination.

The exhibitor would be glad of suggestions as to the diagnosis and methods of treatment. Potassium iodide has been given, also arsenic and iron, without any effect.

Sir STCLAIR THOMSON: This appears to me to be a case of typical tuberculosis of the larynx. This patient has a fixed vocal cord, and there is an infiltration of the epiglottis, the left cord (with ulceration)

and left arytaenoid. This process, arising in three different parts of the larynx, could not be anything but tubercle.

Double Abductor Paralysis.—**William Hill.**—This man had portion of a large goitre removed twelve years ago by two vertical incisions in the neck, and both recurrent nerves have probably been involved in deep contracting scars. It is noteworthy that only the abductor fibres are affected. Alarming attacks of laryngeal obstruction occurred at times on exertion and more especially at night, when he suffered from a severe cold. These attacks have become worse recently. The question is raised whether unilateral chordectomy and removal of the vocal process of the arytaenoid will relieve the obstruction, and whether the voice will necessarily be reduced to a whisper, seeing that adduction is still apparently perfect. Good results have occasionally been reported following unilateral chordectomy, but not by well-known laryngologists, as far as can be gathered, suggestions are invited.

Mr. ROSE: I was present at the operation undertaken for the relief of the paralysis of the vocal cord on a horse some years ago, and I helped Prof. Hobday to operate. The result in that case was not such as to encourage doing the operation on the human subject; there was no material benefit to respiration.

Dr. DONELAN: I think that if the patient would consent to the loss of his voice there should be no difficulty about cordectomy, any more than there would be in respect of removal of cords in epithelioma of the larynx.

Recurrent Ulceration of the Mouth.—**H. Lambert Lack.**—The patient, a woman, aged twenty, has been under my care since May for repeatedly recurring ulceration in the mouth, which commenced last Christmas. She has had similar attacks ever since she had chicken-pox at the age of ten. All the previous attacks have been mild compared with the present one, and have lasted one or two months. Then there has been an interval of at least six months. The spots commence as lenticular or rounded ulcers, with a white sloughy base and surrounding inflamed area. They are very tender and slowly increase in size. So far as I have observed, the spots show no tendency to disappear, except under treatment; one spot which was untreated for three or four weeks attained the size of a sixpence, with a very thickened base. They occur on the mucous membrane of the lips, inside of the cheeks, gums, palate, and tongue. Three years ago they were found on the vagina. The treatment has been the local application of nitrate of silver, which has always seemed effectual, but not in preventing fresh attacks. The Wassermann reaction is negative. The patient is in excellent health otherwise.

Suggestions as to diagnosis and treatment would be welcomed.

Abstracts.

NOSE.

Collapse of the Alæ Nasi: Its Etiology and Treatment.—**Warren C. Batroff.** The "Laryngoscope," 1915, p. 72.

The writer has been impressed with the results obtained by Halle and Joseph, of Berlin, in the plastic surgery of the nose and nasal orifices. He states that pathological collapse of the alæ nasi occurs during forcible

inspiration. Normally these structures should slightly dilate with deep-breathing. The patency of the nostrils is maintained by (1) The normal resiliency of the wings of the nose, (2) By the presence of the alar cartilage, (3) By the muscles that act on the alae nasi. With partial closure of the nasal wings, mouth breathing occurs. This results in continuous negative pressure in the nose, producing chronic hyperemia with secondary hypertrophic changes. Neurotic patients complain bitterly under these circumstances. Collapse of the alae occurs at a secondary affection in individuals who have suffered from nasal obstruction for years. The causes of alar collapse are: (1) Atrophy of the levator muscles; (2) Relaxation of the subcutaneous tissue; and (3) Sharp vertical curvature of the alar cartilage.

Anomalies of the septum membranaceum (commonly called the columella. J. S. F.), have received little attention. This structure may be very broad, thus narrowing the lumen of the nostrils. This may be due to the anterior inferior nasal spine projecting sharply forward.

Treatment. This has generally taken the shape of some form of (1) Splint or dilator, which may vary from a ring of soft rubber tubing to the anatomically perfect, hard rubber type of Schmidhuisen. These appliances prevent the normal vibration of the alae, which regulate the intake of air. (2) Cotton balls coated with vaseline and tucked into the navicular fossa (Heerman). These permit proper exercise of the muscles. (3) Exercising the atrophied muscles against slight resistance before a mirror (Lambert Lack). (4) Should the alar cartilage be so sharply bent that the upper edge lies against the septum, it is advisable to make an incision under local anaesthesia through the mucosa, parallel to and slightly below the upper edge of the alar cartilage; elevate the mucosa, and cut away a narrow strip of the cartilage to restore the lumen of the nostril, and stitch. Dress with collodion. (5) If the alar cartilage is thin and flabby, Menzel advises the injection of paraffin between the skin and cartilage, after packing the vestibule tightly with gauze. If more than the right amount of paraffin be injected the cosmetic effect is seriously impaired. (6) Should deviation or subluxation of the septal cartilage be the cause, it must be corrected by the usual submucous resection. (7) Exostoses of the nasal floor, or thickening of the anterior inferior nasal spine may be removed by an incision at the muco-cutaneous junction: after elevation of the muco-periosteum the projecting part is cut away. (8) A cone-shaped septum membranaceum should be dealt with as follows: A curved incision is made at the junction of the skin and mucous membrane parallel with the edge of the membranous septum. The skin is retracted downwards and the mucous membrane elevated. The thickened parts, such as the subcutaneous and submucous tissues, are carefully cut away with a sharp knife. The operator is now confronted with the excessive width of the skin that is left. To remedy this the needle, threaded with heavy silk, is passed through the skin segment close to the lip, then brought forward over a piece of gauze to the tip and passed through here. Another piece of gauze is placed on the opposite side and the suture firmly tied. In this way the edges of the reduced septum membranaceum are firmly pressed together by a mattress suture. The gauze pads prevent the suture from cutting through the tissues. The stitches are removed in four days. J. S. Fraser.

LARYNX.

Diphtheria of the Larynx in Adults.—J. D. Rolleston. "The Clinical Journal," November 1, 1916, p. 389.

After an interesting *resumé* of the historical aspect of laryngeal diphtheria in adults, the author reports four cases, in three of which the membrane extended to the bronchi and lungs and caused death.

Attention is directed to the general view of authors that laryngeal diphtheria in adults extensive enough to cause hoarseness is very uncommon, and that there is a strong tendency for the membrane to spread downwards. Dyspnoea does seem to occur as one would naturally expect, but it does not seem to be so frequent or so urgent as in children. The general symptoms, prostration and asthenia, dominate the situation and lead to a fatal issue in most cases in spite of the use of antitoxin.

The cases described refer only to those in which the disease had produced hoarseness by involvement of the glottis. The author suggests that laryngeal diphtheria is commoner in adults than his numbers would lead one to believe, but as routine examination of the larynx with the mirror is not carried out in faucial diphtheria, many cases of infection limited to the lateral bands—what Ruault has called *latent croup*—are probably overlooked.

Some of the points brought out by the older authors are worthy of note; Trousseau's observation, for example, that tracheotomy for "croup" in adults is less successful than in children; and Veillon and Brelet's aphorism that "in the child little diphtheria will produce much croup, while in the adult much diphtheria is needed to cause only a little croup."

Dan McKenzie.

Malignant Papilloma of the Larynx.—E. Schmiegelow. "Nordisk Tidskrift für Oto-Rhino-Laryng." Bd. 1, Nr. 1, p. 1.

After an allusion to the "absolute" rule never to neglect the microscopic examination of a suspicious laryngeal growth before proceeding to external operation, the author relates a case in which he was misled by the microscopic evidence into the belief that what proved to be a malignant growth was a simple papilloma.

The case was that of a male, aged fifty-two, whose first symptom, hoarseness, appeared two years before his first visit to hospital. When the larynx came to be examined a large greyish-red tumour, with a cauliflower-like surface, was seen involving the right vocal cord. The naked-eye appearance suggested epithelioma, but the microscopic qualities of pieces removed endolaryngeally were those of innocent papilloma. Under suspension laryngoscopy the tumour was removed, but it recurred rapidly and obstructed the air-way so that a low tracheotomy had to be performed. Three weeks later, laryngo-fissure was resorted to and the tumour, which still presented microscopically the characters of simple papilloma, was exposed to the action of X-rays. The tracheotomy tube was removed about this time, but as the growth again recurred it had to be re-inserted some four months later. A month after the whole larynx was found to be filled with papillomata and they had also extended into the pharynx and were impeding deglutition. The author thereupon performed laryngostomy in order that X-rays might be applied more steadily and frequently. Conditions got worse, however, and complete excision of the larynx was performed. Three months later

a recurrence appeared in the deep pharynx, leading to death following an attempt at its removal.

The interesting pathological features of the case are that at no time and in no place did the papillomata show any tendency to penetrate the underlying tissues, nor did they make any attack upon the laryngeal skeleton, while the lymphatic glands, also, were free from enlargement. Microscopically, the appearances throughout were those of a simple but rapidly proliferating papillomata.

In a *resumé* of similar cases reported in the literature, Schmiegelow quotes Bruns as having pointed out that so far a malignant overgrowth of papillomata has only been reported in adults and never in children. And there is a case in Morell Mackenzie's collection which seems to have presented characters similar to those of the above case, although Mackenzie reported "cancerous elements" at the base of the tumours.

As the literature shows, papilloma of the larynx exhibits a great tendency to recur, and Hublard recently reported a case in which the diagnosis made was adeno-carcinoma, but which seemed, nevertheless, to be a simple papilloma as it was cured by simple endolaryngeal operation.¹

Finally, the author refers to the remarks made in Semon's collection that the instances which various observers cited in favour of their view that operative intra-laryngeal treatment might transform a simple into a malignant growth, were for the most part cases of malignant papilloma of the larynx.

(The author's suggestion obviously is that papilloma of the larynx has shown on certain rare occasions a proliferative growth of such luxuriance as to warrant the use of the title of "malignant."—D. M.)

In such cases only the most energetic treatment—removal of the larynx—is likely to be of any avail.

Don McKenzie.

EAR.

Temporo-sphenoidal Abscess with Unusual Complications.—Leshure, John. "Laryngoscope," 1915, p. 281.

Female, aged fifty-two, suffered from intermittent discharge from the right ear. Examination showed swelling of meatal wall and oedema of adjacent tissues. Just above the zygoma there was a diffuse swelling at a point 1 in. in front of the external meatus. Palpation of this area was very painful, though there was no mastoid tenderness. Temperature, 99° F.; pulse, 78. Next day an incision over the temporal swelling only evacuated a small amount of pus. Three days later the temperature rose to 103° F. The urine was found to contain much albumin and numerous casts. The patient became drowsy, but recovered somewhat for a few days and then again became drowsy and complained of headache. At this period Leshure noted that the right pupil was moderately dilated and reacted sluggishly to light. Ophthalmoscopy showed slight haziness of the disc. The pulse had now dropped to 54 and Cheyne-Stokes respiration was well marked. There was also rhythmical movement of the right arm. A radical mastoid operation was performed, practically without anaesthesia. The antral roof was absent, and the dura was covered with granulations and did not pulsate. The knife entered the abscess cavity at a depth of half an inch, and evacuated two

¹ See JOURN. OF LARYNGOL., RHINOL., AND OTOL., vol. xxx, p. 264.

ounces of thin, non-fœtid, yellow pus. The patient now began to show signs of returning consciousness, so that anæsthesia had to be resumed. Two days later there was severe headache and rigidity of the neck muscles. Lumbar puncture withdrew turbid fluid. The predominating micro-organism was the pneumococcus. During the next two days the temperature rose to 104 F. and the pulse to 160. Death. Permission for autopsy refused. Leshure is of opinion that the first attack of stupor was entirely of uræmic origin.

J. S. Fraser.

MISCELLANEOUS.

The Responsibility of the Physician in Oral Infections.—Haskin, W. H.
The "Laryngoscope," 1915, p. 231.

Haskin urges that surgical measures be employed in all cases where there has been a gum-boil which fails to heal and leaves a fistulous track, however small the opening may be. Such cases are, in reality, cases of suppurative alveolitis which have opened through the external alveolar plate, only after actual destruction of the bone. The alveolus should be freely opened and all carious bone removed, either with or without the extraction of the tooth. Often it will be found that only one root is involved and that this alone need be amputated. Haskin lays stress on the use of the small X-ray film for photographing the individual teeth. He finds it very difficult to awaken any interest among medical men to the great importance of these conditions, but holds that this is not to be wondered at when we consider the entire neglect of any instruction on these lines in our medical colleges. We must realise that almost all the conditions with which we have to deal in our adult patients can be traced back to infancy. At birth there are normally twenty-six tooth germs present in each jaw, and calcification is well under way in the deciduous teeth. Each tooth develops from its crown towards its root, and pushes its way outwards. In normal development the lower teeth should lie just within the upper jaw with the lower molars occluding slightly in front of the upper molars. It will be seen that every effort of nature tends to spread the upper jaw and to push forward the lower jaw at the same time. The alveolar processes can be compared to the muscles in that they need exercise if they are to develop properly. If otherwise, the teeth are slow in developing and are structurally weak, their supporting alveoli being insufficient to place the teeth properly or to hold them securely. Early malocclusion is invariably followed by early loosening of the teeth from the efforts of mastication alone. Normally, stimulation of the alveoli is due to three factors: (1) The pressure of the gum margins against the nipple. (2) The pushing effort made by the tongue, provided that the child is not a mouth breather. When a normal mouth is closed, the person swallows and unconsciously produces a vacuum which causes the tongue to cling to the roof of the mouth and to spread out against the teeth. The lower jaw then drops slightly, being held up by the action of the tongue, which thus tends to pull down the roof of the mouth. (3) The stimulation of teeth and alveoli caused by mastication. Hirilicka, after studying 960 Indian children, found that there was no abnormal narrowing of the maxillary arch, and that cases of enlarged tonsils and adenoids were not met with; that while Indian mothers nursed their children until the

second and third year, they also gave the children various things to chew very early, *i. e.* solid food. These satisfactory conditions were not due to sleeping in the open air as the Indian children slept in the worst possible ventilation. The human skull, face-bones, and teeth are undergoing evolution largely due to lack of use of the organs of mastication. Loss of the internal secretions in artificial feeding may also be a cause.

At the sixth year, the first of the permanent teeth erupt, and on them falls the burden of developing and holding the jaws in their proper place during the shedding of the deciduous teeth. The tendency to early decay of the first molars can undoubtedly be overcome if the proper stimulation be given to the teeth and jaws in early life by regular exercises, *e. g.* chewing on rubber blocks. Without dental caries it is exceedingly rare to have any inflammation of the dental pulp, and without the latter it is rare to meet with apical abscess. Rosenow, of Minnesota University, has shown that a large percentage of these apical abscesses give pure cultures of the streptococcus viridans—the organism that causes ulcerative endocarditis, gastric ulcer, and rheumatic joint affections.

Pyorrhœa or Rigg's disease is now attributed to the endameba which is being pursued relentlessly with emetin and ipecac. Haskin holds that no advanced case of pyorrhœa has ever been cured by these drugs, either with or without scaling of the teeth. Whether it is wise to retain such teeth must depend entirely on the extent of the exposed cemental surface. In this condition prevention is the only real cure.

Failure to cleanse properly the teeth results in the accumulation of mucin plaques in which the saliva deposits salts, thus forming tartar. The borders of the gums are irritated and swollen, and gradually recede. This is followed by inflammation of the adjoining alveolar tissues. Here again endamebæ are believed to cause the destructive process. Closely crowded and irregular teeth are almost impossible to clean. Haskin records many cases to show the evil effects of fixed bridge work.

J. S. Fraser.

THE LATE DR. JULES BROECKAERT.

In addition to the names previously mentioned the following is gratefully acknowledged:

	£	s.	d.
Dr. Dundas Grant.	5	5	0

NOTES AND QUERIES.

COLONEL H. S. BIRKETT, C.B.

It is with great pleasure that we learn that Dr. H. S. Birkett, of Montreal, who has been in charge of a large Canadian hospital in France since shortly after the outbreak of the war, has been awarded the honour of C.B.

Colonel Birkett has been for several years an active member of the Staff of Abstractors for the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, and we are sure that all our readers will join us in extending to him our heartiest congratulations upon this well-deserved recognition.

We are pleased to be able to report also that Col. Birkett has become a member of the Editorial Committee of the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY.

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CEREBRAL SYMPTOMS AFTER NASAL OPERATIONS.

BY SIR STCLAIR THOMSON, M.D.,

London.

WE have all had our anxieties after operations on the nose. Any decided rise of temperature, or any perversion of the patient's mentality, and we are prone to prepare for the worst. If we have been operating in the presence of any markedly pyogenic condition, such as sinus suppuration, the slightest disturbance of progress in the first three days is only too apt to usher in a catastrophe. On the other hand, when the nasal disease is not markedly purulent, the symptoms may be alarming and yet not fatal. Let me briefly record the anxieties which one such case gave me for twenty-four hours. It occurred in a case of Moure's operation for epithelioma of the left ethmoid and maxillary sinus. Nothing untoward happened during the operation. But next day the patient was markedly and alarmingly changed. Instead of being bright, vivacious, and chatty as usual, she was dull, inattentive, silent, and restless. She could easily be roused, but then her speech was hesitating and indistinct. The temperature was 101.2° to 103.6° F., and the pulse-rate was 120 (see chart, Fig. 1). She made no complaint. There were no localising symptoms. Fearing that meningeal infection had taken place through the sheaths of the olfactory nerve, Dr. H. Campbell Thomson was asked to see the case, and he kindly sent me the following report:

"She is undoubtedly suffering from cerebral irritation, and, I think, a little compression, but I don't think the signs at present

warrant one making the diagnosis of septic meningitis. She strikes me rather as probably having some exudation, either serous, or possibly mixed with some blood, and this might have easily occurred as the result of the disturbance of the growth and membranes. If this is so the condition is more one of œdema, and, though very serious, is not such a bad lookout as meningitis. I should not, therefore, at present regard the case as hopeless, though I am not very optimistic about it."

But, happily, within twenty-four hours there was an improvement and the temperature was falling: at the end of forty-eight hours it had reached 100° F., and the patient was brighter, and

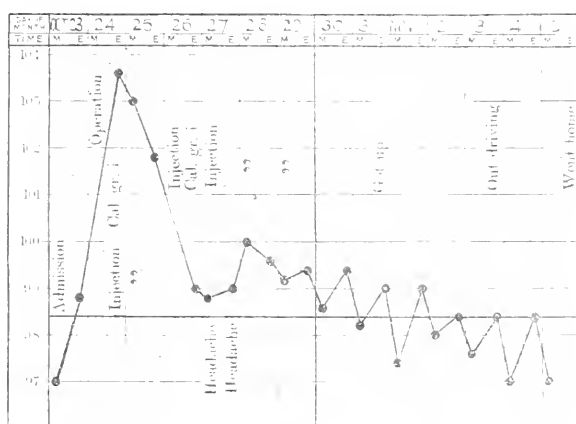


FIG. 1.—Temperature chart of cerebral irritation (? serous meningitis).

her speech was again clear. On the third day the temperature was 99° F., and, with re-awakened intelligence, she complained of severe headache on the left forehead (*i. e.*, the operated side). On the eighth day the temperature had become steadily normal, and the patient was out of bed. Her convalescence was uninterrupted, and she left the nursing home on the twelfth day. The patient was given calomel, bromide, and polyvalent antistreptococcic serum, but I do not claim any special effect from the latter.

In this case, therefore, though nothing went amiss at the operation, alarming symptoms rapidly followed—and soon subsided. Let me recall, for the sake of contrast, two cases in which I shuddered when I realised that my nasal forceps were maneuvering in the anterior fossa of the skull, and yet the patients never manifested an untoward symptom. The first was a lad, with

malignant disease of the nose, which I was endeavouring to remove by the nasal route, and the second was an elderly man with epithelioma of the ethmoid, which I was attempting to remove by a Moure's operation. In both I was manœuvring with great care with a Luc's forceps; there was no rough curetting. But after plucking away a mass of growth, and then carefully palpating the roof of the nose, I realised that the cribriform plate had been eroded away, and felt my instrument brought up by the cushion of the dura mater. The second case was in December last. Through the Moure's incision it was easy to see the bluish dura mater, and I demonstrated its pulsations to the students; yet the patient had not the slightest discomfort from the cerebral invasion. He was sitting out of bed next day, with a normal temperature, and he is still alive, although his disease is advancing.

After operation on the mastoid antrum it is not so rare to be faced with symptoms analogous to those described above, but with ear cases we are much less anxious, and, if an operation has been carried through without *contrectumys*, the symptoms often pass off without treatment or interference. Why are the prospects so different after nasal operations? Are nasal infections more virulent? Are operative measures less satisfactory? Is local resistance feebler? We are inclined to think that, as they say in the House of Commons, "the answer is in the affirmative," and, also, that all these causes may be operative, separately or conjointly, in causing the alarms and disasters we are more exposed to in nasal than in aural surgery. This is not the place to discuss the matter of the greater virulence of nasal suppuration—if it does exist, and can be proved. But even an ordinary acquaintance with the surgical anatomy of these two regions will suggest that physiological abnormalities are much more frequent in the topography of the accessory nasal sinuses than in the anatomy of the temporal bone, and that the former can never be openly exposed in the way that we can display our field in the radical post-aural operation. Consequently, nasal drainage is always much more inadequate, and if discharge is kept back in some cellule or *cul-de-sac*, it may easily invade the dangerous diploë of the frontal bone, or reach the meninges through the shell-like bone which is all that bars the way through the nasal roof. For that which renders nasal surgery so much more risky, and cerebral complications so much more deadly, is the ever-present fear of the cribriform plate. This is our great danger. There is nothing analogous to it in ear surgery, where the aurist's chief *bête noire* is damage to the facial nerve. He may

burst into the lateral sinus or open the middle fossa of the shell, and yet he need not be down-hearted. But if the rhinologist takes the wrong turning in the ethmoidal labyrinth, or if his curette skids and damages the roof of the nose, and he opens a communication trench with the anterior cerebral fossa, he knows only too well that, if the necessary organism is about, he may have opened the way to a meningeal invasion of streptococci, whose progress neither medicine nor surgery is able to arrest. The dura mater is never prepared to help in rectifying a sudden slip in this area, as it does by throwing up defensive breastworks on the inner side of the temporal bone, or by thickening and strengthening the dura mater when the latter is slowly invaded by a malignant growth. Worst of all, the cribriform plate is not only perforated and brittle like a water biscuit, but is traversed by the fibres of the olfactory nerve, each one of them with its lymphatic sheath, allowing free communication between the olfactory area of the nose and the meninges. It is doubtless by this route that infection has travelled in those instances where an autopsy shows that there has been no traumatic lesion of the danger zone (Hinsberg). Such a possibility may be a comfort to us when we do, rarely, get into trouble—but, alas, it must also make all of us more anxious in all cases!

This area must always be a danger zone, even to the most skilful, and those who still have what Monre calls "*une main inexpérimentée ou malhabile*" should give it a wide berth, particularly in cases of sinus suppuration.

It has been suggested that such cases of cerebral irritation, or serous meningitis, are possibly more common than generally acknowledged, that they are manifested chiefly by a change of mental state and a rise of temperature, and that a safe and beneficial remedy is a lumbar puncture. I had not intended dealing with the treatment of these post-operative symptoms, but this recommendation appears so sound and promising that I feel I must not omit to mention it.

THE CAUSATION AND PREVENTION OF EDUCATIONAL DEAFNESS.

By MACLEOD YEARSLEY, F.R.C.S.,

Otologist to the London County Council Deaf Schools; Lecturer and Examiner to the Training College for Teachers of the Deaf, etc.

"Nothing extenuate, nor set down aught in malice."

IN the Report of the Medical Officer (Education) of the London County Council for 1909, p. 76, I gave an analysis of the causation of deafness in 500 cases occurring in the deaf schools. The cases which have passed through my hands during the nine years which I have passed in the service of the London County Council as otologist have now reached (December 31, 1916) a total of 1863, a number which allows a far better opportunity for obtaining the true proportion of causation than does the much smaller one. Moreover, increased experience and greater deliberation in coming to a diagnosis has enabled me to sift a considerable number of cases which were formerly not only by me but by many other observers thrown into the somewhat vague group of "congenital deafness." It has been pointed out in recent years by Kerr Love, with whom it has been a great honour and pleasure to work for the deaf child, that the so-called congenital group of cases contains numerous instances that were not really born deaf, but had become deaf during the first two years of life, many of them being cases of meningitis. Further, Kerr Love insists that of those cases which have been undoubtedly born deaf, there were two distinct and well recognised classes, that of *hereditary* and that of *sporadic deaf-birth*. It will be seen from the analysis here presented that Kerr Love's observations are corroborated.

I shall divide this paper into two parts; the first dealing with causation, the second with its natural corollary—the means which are pointed out by the first as being at our disposal for the prevention of deafness in infancy and childhood. And here I feel it my duty to bring to the notice of otologists that they seem hitherto to have paid far too little attention to the prevention of deafness, a question in which the whole future of otology must be bound up if it is to keep its place as a progressive branch of medicine and surgery. Hitherto so much attention has been given to the treatment of middle-ear suppuration and its complications that the great possibilities of prevention appear to have been lost sight of. One is often forced to the opinion, from experience of many cases of suppuration met with in the deaf schools, that the radical

mastoid operation is too often performed without regard to the conservation of hearing and with a forgetfulness as to the primary function of the ear, which is disastrous to the child's future. That otologists do sometimes, however, think of the preventive side of their science is evidenced by the fact that they have lent the weight of their authority to an endeavour to obtain more rational and more efficient treatment of the ear in fever hospitals. This paper is meant, therefore, as an appeal to otology to widen the scope of its energies by urging persistently the prevention of infant and child deafness in other ways.

I. THE CAUSATION OF EDUCATIONAL DEAFNESS.

By "educational deafness" is meant the degree of loss of hearing which prevents a child from obtaining the full benefit of ordinary education in an elementary hearing school, and necessitates his being taught in a special deaf school or "hard-of-hearing" centre. I may turn aside for a moment here to point out that few otologists are well acquainted with the system which provides in London for the special education of the deaf child. Did they realise this system better, the educational authorities would receive better assistance from hospital surgeons than they do now. Moreover, some otologists do not seem to realise that what appears to be an improvement in hearing is sometimes merely due to development of lip-reading. Testing always with the child's back turned will soon bring the realisation of this fact. An instance of this occurred to me quite recently. A child presented to me for decision as to her education, whom I had already seen twice at intervals of some months, appeared to hear quite well. When tested with simple sentences in a raised voice with her back turned, she made no response, but she interpreted the same sentences given voicelessly at ease when she faced me at twenty feet away.

The London County Council possesses six elementary day schools for the deaf, where children are taught by the oral system until the age of thirteen. There are, besides, two residential secondary schools, one for each sex, where their education is continued from thirteen to sixteen. A third residential school provides for those who are also blind, mentally defective, or have failed in the oral system. Certain cases are sent as well to residential institutions for the deaf outside London, but the Council wisely prefers the day-school system. For reasons which need not be entered upon here, there are distinct advantages in the day over

the residential system. It is sufficient to point out that the whole aim of deaf education is to fit the deaf child to fight his battle side by side with the hearing, and that, consequently, any arrangement which tends to the segregation of the deaf as a class is bad.

But there are a number of borderland cases in which the degree of deafness is not sufficient to warrant their inclusion in a deaf school, although it is enough to prevent education in ordinary elementary schools. These children were not provided for when I first became connected with the Council. Realising the great importance of this, which is called the "hard-of-hearing" class, I induced the Council, some four or five years ago, to establish an experimental "hard-of-hearing" centre. The great success of this departure has led to the establishment of three other centres on similar lines. In these "hard-of-hearing" or "partially deaf" centres, the children are educated partly by teachers of the deaf, partly in ordinary hearing classes in elementary schools. The effect of this is that they learn to lip-read rapidly, and many cases, after six to twelve months of this method of education, are able to return to their original hearing schools, and there hold their own with children of normal hearing. Indeed, during the past two years, two of them have won scholarships in competition with hearing scholars.

To return now to the subject of causation. The accompanying table shows the analysis of the 1863 cases with which I have had to deal in the past nine years.

I propose briefly to consider these causes *seriatim*, space forbidding too great detail.

I. CONGENITAL CASES.—The first thing which strikes one in this table is that the number of acquired cases is considerably in excess of that of the congenital cases. In former analyses of causation the numbers have been approximately equal. Here, however, there are 654 congenital to 1209 acquired cases (35.1 per cent. to 64.3 per cent.). This, as a matter of fact, is what was prophesied some years ago by Mygind ("Deaf-mutism," London, 1894, p. 16), who said that "future investigators will perhaps prove that acquired deafness has a still greater preponderance in the causation of deaf-mutism than we are authorised at present in believing." Further, more accurate information as to previous histories than it has been possible to obtain would, in all probability, still further reduce the percentage of congenital cases. So long as the State cares more for the excellence of its domestic animals and the fees of its lawyers than it does about the breeding of its own citizens, so long

will the little information as to family and previous personal histories be meagre and unreliable. The time is not yet come when we can speak with confident accuracy upon the exact causes of many infantile conditions, which the more far-seeing amongst us

Causes.	Boys.	Girls.	Totals.
I. CONGENITAL.			
Hereditary	38	36	74
Sporadic deaf birth	306	265	571
Congenital aphasia	6	3	9
	— 350	— 304	— 654
II. ACQUIRED.			
<i>Infective Diseases.</i>			
1. Varicella	2	—	2
2. Diphtheria	10	10	20
3. Enteric	—	3	3
4. Rötheln	1	—	1
5. Influenza	1	3	4
6. Measles	73	57	130
7. Mumps	1	1	2
8. Pneumonia	16	11	27
9. Rheumatic fever	1	1	2
10. Scarlet fever	53	59	112
11. Congenital syphilis	30	50	80
12. Tubercle	6	4	10
13. Pertussis	9	6	15
	— 203	— 205	— 408
<i>Diseases of the Nervous System.</i>			
1. Epidemic cerebro-spinal meningitis	3	5	8
2. Other forms of meningitis	97	80	177
3. Hydrocephalus	2	1	3
	— 102	— 86	— 188
<i>Primary Ear Diseases.</i>			
1. Middle ear catarrh	112	120	232
2. Middle ear suppuration	118	96	214
3. Otosclerosis	1	1	2
	— 231	— 217	— 448
<i>Other Causes.</i>			
Injury	45	25	70
	— 45	— 25	— 70
III. DOUBTFUL	54	41	95
	— 54	— 41	— 95
Totals	985	878	1863

deplore as at present unavoidable, although undoubtedly preventable.

The cases classified as congenital may be divided as follows :

Hereditary deafness	74
Sporadic deaf-birth	571
Congenital aphasia	9

Hereditary Deafness may be defined as that in which the family history shows other deaf-born persons either in the direct line or collateral branches. Every one of the 74 cases agreed to this definition. Owing to the paucity of information as to family history in the majority of the 654 congenital cases, it is probable that the full number of instances of true hereditary deafness has not been obtained, and that the percentage of 12.7 should be higher.

We owe the separation of hereditary deafness from sporadic deaf-birth to Kerr Love, and I do not propose to enter here into its causation. It may be pointed out, however, that the Mendelian theory gives an explanation of the fact that deaf-birth may appear in what was formerly considered to be an unexpected fashion in families showing hereditary deafness. If no further fact were made patent than that the union of two hereditary deaf persons may give rise to deaf born and hearing offspring, and that the latter may carry the recessive character of deafness, and so may, even when mated with hearing persons, produce further deaf-born children, that fact alone is of vast importance in prevention. From the study of such imperfect family trees as we possess of hereditary deafness, Kerr Love has shown that hearing appears to be the *dominant* and deafness the *recessive* character. Hence, in order that the number of hereditary deaf-born persons may be reduced, it is important that those known to carry the recessive character should not be allowed to mate together, or that, if permitted to marry, they should mate only with hearing persons whose family histories are without taint of deafness. I shall refer to this again in speaking of consanguineous marriage.

Sporadic Deaf-birth may be defined as that in which the family history is deficient in other deaf-born relatives save in the same generation, but may contain instances of other defects, mental or physical. Such deaf cases may occur singly, or in several brothers and sisters. It is this group that has for so long formed a sort of lumber heap for uncertain cases. Some of these cases may possibly be instances in which the deafness was really acquired in early life. Indeed, it is quite common to find that, in many children believed to be congenitally deaf, the defect was not detected until as late as the second year of life, and may have been due to some cause which has escaped detection. I have gone carefully into my records in order thoroughly to sift out all doubtful cases, but, in spite of every care, it is possible that there are still some of the 571 who were not born deaf.

The most interesting facts about these cases were, briefly, as follows :

1. *Consanguinity*.—Sixteen were the offspring of first-cousin marriages ; 3 of the marriages of second cousins ; 4 of the marriages of cousins whose degree was not ascertained (in one of these the child was also illegitimate). In one additional consanguineous case the father of the child was also the father of the mother.

Now consanguinity has always been made a prominent factor in deaf-birth by former investigators. Fay, in his "Marriages of the Deaf in America," devotes a chapter to consanguineous marriages of the deaf, of which there were 31 in 4471 unions (0.693 per cent.). This percentage is small, but it must be remembered that it refers to marriages of the deaf only. Fay's investigations showed that the percentage of deaf children born from marriages reported as consanguineous was nearly four times as great as from marriages not so reported.

In a paper on "The Question of 'Concubintancy' in Cousin Marriages" (*Lancet*, 1914, vol. i, p. 167), I endeavoured to trace, from a collection of the family trees of 68 consanguineous marriages obtained from various parts of the United Kingdom, France, Portugal, China, and Germany, the true part played by consanguinity in heredity. I arrived at the opinion that the results of such marriages is largely a question of *stock*. Examples of good and bad stock in first-cousin unions seemed to suggest that quality of stock is all-important. Arguing upon Mendelian lines, if the stock is good and free from taint of hereditary deafness, there is no reason why the offspring of a consanguineous marriage should show deafness, because that recessive character is not present ; whereas, if deafness should happen to be present as a family taint, the union of two blood relations, both of whom may carry—although they may themselves be hearing—the recessive character in their germ-cells, would be likely to accentuate it, and recessive offspring would occur with a frequency which would follow the Mendelian hypothesis. That is to say, they would act as "impure dominants," giving rise to three dominants to one recessive, of which the recessives would breed true, and of the three dominants, two would be impure.

2. *Illegitimacy* occurred in 12 cases (2.1 per cent.). Mygind (*ibid.*, p. 102) discusses illegitimacy as a possible factor in deaf-birth, and points out that the comparatively small number of illegitimate deaf-mutes may be owing partly to the high mortality

which prevails among children born out of wedlock, but the difference between illegitimate births in general and in congenital deafness cases in particular is so considerable, as to suggest that illegitimate children are less liable to deaf-mutism than others, possibly because illegitimate unions are seldom consanguineous. It is for the reason of Mygind's attention to the factor that I mention it here. Personally, I consider that it is an entirely negligible quantity in the question of deaf-birth. Since illegitimate children are said to be less cared for than are those born in wedlock, it is conceivable that it might have a more important bearing upon acquired deafness.

3. *Syphilis*.—Whilst so many of the earlier investigators have spent much time upon seeking to establish the value of consanguinity, illegitimacy, maternal impression, and other minor factors in the causation of deaf-birth, to the neglect of more important lines of research, it has remained to Kerr Love to approach the problem from a much wider purview. Having separated hereditary deafness from sporadic deaf-birth, he has established, once and for all, some of the serious causes which underlie the latter. Kerr Love looked at it from the social aspect. He found "that the social status of the families from which the deaf children of Glasgow come is that of the house of one apartment." From my nine years' experience of the children in our London deaf schools, I can endorse Kerr Love's results as to their lowly station in the social scale. It is true that we do not possess the same tenement system that exists in the Scottish city, but there is no doubt that a majority of our deaf children come from a class equally as poor and badly housed. No doubt the same can be said of others of the world's great cities. The conditions under which the poorest classes exist—it can scarcely be called living—mean those of overcrowding, carelessness of child health, uncontrolled abuse of alcohol, and especially, as Kerr Love has emphasised, untreated syphilis—conditions all of which make for a high infant mortality and a high rate of deafness. Few people realise the potency of these deplorable conditions as factors of disease, or, to speak more plainly, many people know it, but few realise it. The awful and continual struggle for existence that goes on amongst the poorest classes makes for the reverse of social well-being and love and care of family. Parental neglect is rife, and instances are of daily knowledge to those whose duty brings them in contact with the submerged portion of our great cities. Dire poverty and squalid overcrowding are, almost of necessity, associated with

neglect of children. The duties of the parents often seem to cease with the birth of their children.

The conditions under which the poorest class is to be found mean poor air, poor food (and very little of it), poor clothing; all of which, besides the results of untreated syphilis, react disastrously upon the child's mental and physical development. Yet the poor child is not born physically worse off, the fault lies not in *nature*, but in *nurture*. He falls an easy victim to disease, and especially to those diseases which destroy the organ of hearing in early life, and so cause acquired deafness. There is, or, until recently, there was no apparent reason for sporadic deaf-birth, unless there was some poison which could destroy the hearing before birth. Kerr Love has pointed out that such poison does exist in syphilis.

The exigencies of space forbid a detailed account of Kerr Love's researches and conclusions. They are to be found in his "Four Lectures on the Causes and Prevention of Deafness," published by the National Bureau for Promoting the General Welfare of the Deaf, in 1913. I wish, however, to mention how far my own cases go to corroborate his conclusions. Unfortunately, there do not at present exist facilities in the London County Council for the investigation of sporadic deaf-birth by means of the Wassermann reaction. In 48 cases in which I had the test done at my own initiative, 3 (6.25 per cent.) were positive and 45 (93.75 per cent.) were negative. There were, however, 14 other cases whose family histories were such as to be strongly presumptive of syphilis. The key to the deafness with which syphilitic children may be born lies in the frequency of meningitis. The investigations of early observers have established the frequent occurrence of this in still-born children, and in children who have become deaf after birth. There exists in the meningitis of syphilitic children a definite chain, the links of which are evident as connecting three classes of deafness—the acquired deafness during school age, the acquired deafness which occurs during the first two years of life (and which may easily be mistaken for congenital deafness), and the true sporadic deaf-birth due to aural complications initiated *in utero*. This chain has been established by Kerr Love. He admits that, speaking generally, the evidence of syphilis amongst the congenitally deaf is not so fruitful as amongst those whose deafness is acquired, but, at the same time, he insists that the evidence is quite definite. He concludes that congenital deafness is usually an evidence of expiring syphilis, and that the Wasser-

mann reaction does not discover all cases of congenital deafness which are due to congenital syphilis.

It must be emphasised that congenital syphilis acts as a cause of sporadic deaf-birth far more frequently among the poor, in whom it goes so often untreated and works in conjunction with poverty and overcrowding. When syphilis occurs amongst the better classes, it does not cause nearly so much deafness, although deafness and blindness due to congenital syphilis are not unknown amongst them. This is because, in the well-to-do, the disease receives proper treatment. Supervision and treatment are often impossible amongst the poor, partly on account of ignorance, partly of lack of time and of expense.

4. Most of the other causes that have been advanced as inducing deaf-birth, such as influences during pregnancy, twisting of the umbilical cord, pressure on the fetal head, etc., must be discarded as unlikely to prove worth consideration. In a certain number of cases "maternal impression" was offered as an explanation, but upon none of these could any reliance be placed. Two cases, however, one in which a severe fall occurred during pregnancy and one in which the mother was brutally kicked and ill-treated shortly the child was born, may be included as presumptive of serious before pre-natal injury.

Congenital Aphasia.—Only 9 cases could be described as true congenital aphasia ("word-deafness"). In several other cases a provisional diagnosis of this condition was found later to be untenable.

(To be continued.)

LUMBAR PUNCTURE IN MASTOID DISEASE.

BY ARCHER RYLAND, Capt. R.A.M.C.,

Aural Surgeon, Cambridge Hospital, Aldershot.

THE writer ventures to submit a brief statement of reasons in favour of the routine employment of lumbar puncture in all cases of acute infective aural disease upon which it has been decided to operate. The reasons are:

(1) Because it is highly desirable to know previous to any operation upon aural disease which falls into that class of case under consideration whether or not the spinal fluid is turbid.

An aural diagnosis which has taken into account the condition

of the lumbar fluid is of higher value than one that has not done so. The procedure is dangerless, and, in the great majority of cases, it is quickly and easily performed.

In all cases upon which it has been decided to operate, it is suggested that a specimen of the spinal fluid be obtained as soon as the general anaesthesia is complete, and before the operation begins.

(2) Because, in certain instances, the tissue reactions fail, and the middle-ear infection proceeds with great rapidity to an intracranial and meningeal infection.

It is extremely difficult, if not impossible, to know whether or not a given case of acute mastoid disease will be a case of this type.

The evidence that we get from an actual operation does not answer this question. When an operation exposes the diseased area, it is not uncommon to find an almost complete absence of Nature's barriers or rallying zones (in the form of extradural abscess, suppuration of mastoid antrum and cells, or lateral sinus-tissue changes) across the path of an advancing infection.

As a matter of observed fact, a diffuse, or perhaps focal inflammation, of mastoid cells, with or without a mere reddening of the cell linings, may be found to be the whole visible extent of the local tissue reactions.

Cases of this nature occur with some frequency, and they are treacherous. They are, no doubt, of far less common occurrence than the type of case which must be ranged at the extreme opposite end of the scale, where local tissue changes in their well-known manifestations are vigorous and prompt.

If we know, before beginning to operate, that the fluid is turbid; if we know from the actual operation evidence that tissue reaction has failed, has been defeated, or has never been initiated; then it becomes clear that we are dealing with a case of grave nature.

It is better to seek out and possess ourselves of this knowledge at the time of the operation, when possibly a prompt translabyrinthine drainage might be successful, than to be suddenly confronted and surprised with this knowledge some hours or some days afterwards, when a translabyrinthine operation may be too late to be effective.

It seems to the writer that if we do not obey the earliest sure indication for drainage through the labyrinthine route, it is of little use to wait and obey a later one.

When the abdominal surgeon opens the abdomen in order to deal with a presumed localised affection, he will know, in most of his cases during the course of the operation, whether or not he has to deal, after all, with a diffuse peritoneal infection. The operation which the aural surgeon carries out gives him no corresponding knowledge with regard to the state of the meninges.

(3) Because it is probable that a certain proportion of these cases which begin to manifest signs of meningitis after an aural operation has been in reality cases of meningeal infection for hours, or even days, before an operation was performed.

(4) Because lumbar puncture as a routine procedure would do much to establish the frequency of occurrence, and to inform us as to the type of case in which we are to expect occurrence of the condition known as meningitis serosa. Also it might result in a more clear and complete elucidation of the condition itself.

(5) Because the procedure would afford a safeguard of some value to the reputation of the operator.

SOCIETIES' PROCEEDINGS.

THE AMERICAN LARYNGOLOGICAL, RHINO-LOGICAL, AND OTOLOGICAL SOCIETY.

Meeting at Chicago, June 15 and 16, 1915.

(Continued from Vol. XXXI, p. 535.)

Some Investigations of the Salivary Glands in Health and Diseases.—**Thomas E. Carmody.**—There is notable lack of literature on this subject, due to the rarity with which the salivary glands are affected, or to the fact that cases are not considered by observers as of sufficient interest to be reported.

Among pathological conditions mentioned by the author as involving the salivary glands or ducts were mentioned: Calculus; injury to or stoppage of ducts by mucous plugs, constriction, or cicatricial bands; Mikulicz's disease; tuberculosis; air tumours; new growths; chronic hypertrophy; atrophy; and congenital defects.

Mistakes in diagnosis of these conditions seemed to be the rule, probably due to the infrequency of most of them.

Is there any reason why the salivary glands are so free from disease? It had been suggested that these structures are more frequently affected in persons who are careless about their teeth, though this view could not be substantiated. A badly decayed tooth, however, was frequently found opposite the opening of Steno's duct in cases of diseases of this duct or of the parotid gland. The rich blood supply of the tissues about the

mouth could not explain the special immunity of the salivary glands; nor could the good drainage, which characterises the parotid, especially the superior portion, account for this relative immunity, because the submaxillary and sublingual are not so advantageously situated.

Although a good deal of work had been done to determine the protective action of the sulphocyanide of potassium, nothing had been definitely determined in this regard.

The continuous flow of secretions from the glands probably had as much to do as anything in preventing infection, but it must be remembered that in the case of the kidney one would expect, on account of gravity, that there would be small chance of infection taking place by way of the ureter, and yet the kidney was probably more frequently involved than the salivary glands: in tuberculosis, for example, the kidney is affected twenty-five times to one of the salivary group.

The thought presented itself that the glands and tissues might be among the last to lose their vitality, a view which the author believed to be true. It had been his observation from a limited investigation with glands obtained *post-mortem* that patients who were very ill with various diseases digested starch at ordinary room temperature and at 40° F. as well as the control of presumably normal saliva. The starch test, while the best at hand, left much to be desired. This test is made with a 1 per cent. paste made by heating the required amount of starch with a little water, and adding enough water to make a 1 per cent. solution. Of this solution the tubes are taken containing 5 c.c. each, and one drop of filtered saliva is added at intervals of one minute, one drop of a N/20 iodine solution is added and changes noted. The first few tubes show blue, gradually becoming lighter until at the end of ten minutes, a straw colour is given. The blue colour was due to the reaction of the starch to iodine, the gradual change to reddish is for the reason that the starch is changed to erythrolextrin, which gives a red colour, and on further digestion achro-dextrin is found, which gives no colour. This, however, will not be found for at least twenty minutes at ordinary room temperature, unless a large amount of saliva is added. If tested at 40° the change takes place more rapidly. No quantitative tests for soluble sulphocyanide have as yet been made.

The author reported fifteen cases of disease and injury to the salivary glands.

Review of the Most Important Recent Contributions to the Treatment of Diseases of the Ear.—George L. Richards.—The author presented abstracts of literature on the following: (1) Closure of Eustachian tube during the radical operation; (2) Radical Mastoid Operation; (3) Operative Treatment of Otitis Media; (4) Meningitis; (5) Vaccines; (6) Blood Cultures; (7) Use of Radium; (8) Salvarsan; (9) Hearing Power of the Vestibule; (10) New Instruments.

Dr. FRANK ALLPORT said the radical mastoid operation, which was a serious procedure, should not be undertaken without careful consideration. The spoken and written contributions to the subject during the past two years had tended to mitigate the enthusiasm of a good many mastoid performers, himself among the number. All other means should be tried before resorting to operation. Even in the most skilful hands the operation was not always successful. Nevertheless, he wished still to go on record as holding that, if something must be done, if all other measures of a conservative nature have been exhausted, if the point has been reached where some surgical procedure must be recommended,

nothing had been proposed which would take the place of the properly performed, old-fashioned, radical mastoid operation. The conservative method, as advocated by Heath and others, had very few enthusiastic followers, especially in this country. He had been surprised to read, in a paper by Haskin, the statement, which Dr. Richards quoted, to the effect that the author had not performed a radical mastoid operation on a private patient for some time. He could not understand how a man who sees a great variety of cases could arrive at this conclusion. In dispensary practice, where patients could not be given the care that private patients receive, it was necessary to perform the radical mastoid operation, according to Dr. Haskin, who claimed that by means of his vacuum cleaner he could obviate the necessity of doing the radical mastoid operation. There seemed to be some divergence of opinion as to what should be done with the Eustachian tube in the radical mastoid operation. So far as he was concerned there seemed to be but one way, and he paid a good deal of attention to the closing of the tube. Kyle, of Los Angeles, in a recent article, advocated paying no attention to the Eustachian tube. A case might be perfectly well in every other respect, but if there is a constant dripping from the Eustachian tube it was certainly not cured so far as the patient was concerned. If the Eustachian tube was left untouched, the patient would still go through life with a discharge. He thought, therefore, that strict attention should be paid to the closure of the mouth of the tube, by the Yankauer or any other efficient method.

Dr. THOMAS J. GALLAHER considered Dr. Yankauer's contribution to the treatment of the Eustachian tube both in chronic suppuration and in stenosis of great value. In the radical mastoid he had found this method very satisfactory. In many cases of chronic suppuration the closure of the tube would prevent a mastoid operation. However, it was not intended to take the place of the mastoid operation when the indications were clear for such procedure. He had found Yankauer's method extremely gratifying in stenosis of the tube, using, of course, the special instruments devised by him. In routine work the calibre of the tube should be known, and he had long since discarded the Toynbee tube with inflation to ascertain this fact. Even in cases of combined internal ear disease and tubal obstruction the tube should be made as patent as possible, which often improved the hearing although the internal ear condition remained uninfluenced. In cases of chronic perforation often this could be closed if proper drainage is established.

Dr. E. B. DEXCH referring to the question of bacteræmia in sinus thrombosis, called attention to the point, not mentioned by the essayist, that in a certain stage of sinus thrombosis one should not expect to find bacteræmia. In the development of this condition there was first the formation of the parietal clot. At first there was bacteræmia; suddenly there was none, but the temperature continued. That meant that the clot formation was continuing. After two or three days the blood was again filled with bacteria; that meant that the clot was breaking down. He cited a case in which the sinus was accidentally wounded. He expected to find bacteræmia and had blood cultures made from the second day. At first there was no bacteræmia, but after eight days there was. It was not until the clot broke down that the bacteria were found in the blood. In closing the Eustachian tube he had found it advantageous, after curetting, to so place the skin graft that it laps over the anterior wall of the canal, then to force the graft down into the tube. When the tube was left open, instead of having dermatisation of the tympanic cavity

there was proliferation of mucous membrane. Another plan which he had tried last winter was the use of a piece of bone, shaped with the rongeur forceps.

Dr. J. A. STRUCKY emphasised the importance of a careful examination of the ear in every case in which salvarsan is to be administered. In his two cases, to which Dr. Richards referred, complete deafness in the ear previously affected with chronic suppuration followed the use of salvarsan. He had had more trouble with the Eustachian tube than with any other part of the radical mastoid operation. He had had unsatisfactory results unless he managed to close the tube. The method he employed was that described by Dr. Dench, plus the use of the Yankauer curette.

Dr. WENDELL C. PHILLIPS thought a paper like that of Dr. Richards important, especially as it gave an opportunity for clearing up the records. It emphasised, too, the importance of being careful in making statements. The members of the society must give Dr. Haskin credit for some very valuable work with reference to the vaccines, and for his radical mastoid work. It was unfortunate, however, that Dr. Haskin should have made the statement, in the contribution to which Dr. Allport referred, that he had not done a radical mastoid operation on a private patient in four years. That statement should have been qualified by mentioning the fact that he had had no case of chronic middle-ear suppuration with symptoms of meningeal or labyrinthine complications. The speaker did not believe Dr. Haskin meant to convey the idea that he would not do a radical mastoid operation in such cases. In the presence of distinct evidence of extensive cholesteatoma no other treatment than the radical mastoid operation was indicated. These were the dangerous cases. As he looked back over his cases for the last few years he could not recall a single case of fistula where he did not find cholesteatoma. Such cases could be classed as suitable for no other treatment than radical mastoid operation.

Dr. RICHARDS, in closing the discussion, said if those who thought they would get rid of cholesteatoma, when present, in every case of radical mastoid operation, would study the pathological anatomy of cholesteatoma of the temporal bone they would be convinced that in many cases the cholesteatoma had penetrated many cells of the bone which could not be removed without destroying the life of the bone or of the patient.

Brain Abscess of Otitic Origin, with the Report of Five Cases.—
John W. Murphy.—Five cases of brain infection of otitic origin are presented as illustrating that every case of suppurating ear is a menace to the patient. These cases are interesting (1) From the slight symptoms presented up to within a few hours of the time of operation; (2) In every case it was possible to trace the origin of the infection to a lesion in the middle ear, in three of the operated cases, at the time of operation, and in the two non-operative fatal cases at a subsequent post-mortem. The portion of the brain most likely to be involved from middle-ear infection depends upon the manner in which the infection occurs. In the author's experience, when infection occurs by direct continuity, the temporo-sphenoidal lobe is most often the site of abscess formation. When the extension is through the labyrinth, then the abscess is most often on the anterior aspect of the cerebellum, since the abscess is most often found adjacent to the infected bone area.

In the first case, a male, aged sixty-three, developed soreness in neck and back of right ear, following exposure to severe cold. No discharge from ear, but evidence of old chronic inflammatory middle-ear trouble

Temperature 102° F. next day, with considerable pain along tendons of sterno-mastoid muscle, with some tenderness at the tip. Mastoid operation failed to reveal the seat of the trouble until the entire tip had been explored. In the under surface of the tip there was a perforation about the size of a lead pencil, which opened into a large abscess at the tip. The pus had travelled along the tendon of the sterno-mastoid muscle, and had produced a typical Bezold's abscess, containing several ounces of thick, creamy pus. The entire pneumatic process was one mass of necrosed cells and pus. A large opening in the tegmen tympani communicated directly with the dura, through which a quantity of extra-dural pus escaped when the opening was enlarged and the dura depressed. The bone destruction was quite extensive. The middle ear presented no symptoms of the process, which was explained by the presence of firm granulations in the attic completely shutting off communication with the middle ear. Satisfactory recovery after radical mastoid operation and drainage of the Bezold abscess.

CASE 2.—Male, aged fifteen. Following exposure he complained of pain in the left ear, with beginning discharge the next day, and cessation of pain. Under treatment with hot boracic acid douches the discharge gradually lessened, and in about ten days ceased: starting up again however, a week later. Despite free myringotomy by the family physician the discharge continued. Symptoms simulated violent frontal sinusitis, yet examination was negative. Following a severe convulsion and unconsciousness, the author was consulted. The patient was profoundly unconscious. The left external canal was full of mucus-like pus. From the symptoms, the diagnosis was made of localized acute meningitis. Opening and drainage of mastoid advised, but patient died, without having regained consciousness, early next morning. *Post-mortem* examination showed on the petrous portion of the left temporal bone several areas of roughened bone, showing the point of meningeal infection. The entire petrous portion of the bone was filled with pus and broken-down bone cells. The left frontal sinus, the seat of the pain, was found to be normal. The tegmen tympani was also eroded. The left temporal lobe was much discoloured, but no abscess was present. A well defined acute meningitis of this lobe was present, which accounted for the intracranial symptoms, obstinate constipation, Jacksonian epileptic seizures, and paralysis of the third nerve, all of which characterized the case.

CASE 3.—Male, aged six. Symptoms of mastoid involvement following a discharging ear. Simple mastoid operation, two weeks before the writer saw the patient, was followed by symptoms of cerebral complications. A diagnosis of temporo-sphenoidal abscess was made, and operation instituted. An enormously enlarged encysted abscess was found in the temporo-sphenoidal lobe. Complete recovery. Child well one year later.

CASE 4.—Male, aged seven. Operated upon by another surgeon for abscess of the right ear. Wound back of ear did not heal, but continued to discharge foul-smelling pus, varying in degree. Child seemed normal otherwise, and was at school. No cerebral symptoms. External ear dry, drum and hearing apparently normal. Thinking he had simply a sinus to deal with, the essayist opened the mastoid wound, taking his usual precaution, where he did not perform the mastoid operation, of going some distance outside the original incision, to lessen the danger of injuring dura or sinus, if either have been exposed. He found that neither the antrum nor a single mastoid cell had been opened, but that a

button of bone about the size of a silver half-dollar had been removed from the temporal bone. Through this opening there was a tense, bulging, non-pulsating dural protrusion. Exploration revealed an encysted temporo-sphenoidal abscess, from which was evacuated about four ounces of most offensive pus, in which there seemed to be much gas. The symptoms from which the patient had suffered for months were undoubtedly due to this encysted abscess, which leaked externally when the pressure became too great. This leakage doubtless saved the patient's life. Rapid convalescence followed evacuation of the abscess.

CASE 5.—Male, aged thirty-five, was brought into the hospital in a profoundly comatose condition, and no history was obtainable. Pupils contracted, not responsive to light; corneal reflex abolished. Temperature 99° F., pulse, 190; respirations stertorous. Urine negative. Over right mastoid there was an old scar of a former mastoid operation. There was pus in the right external auditory canal. The patient died before he could be operated upon. Immediate examination revealed a large temporo-sphenoidal abscess. From the amount of cerebro-spinal fluid that came away with the pus, the writer was satisfied that the sudden torpor was due to the abscess bursting into the lateral ventricle of that side.

DR. NORVAL H. PIERCE took issue with Dr. Eagleton in the matter of operating through a large opening in both skin and bone in infected areas. He had witnessed bad results from extension to the brain. He had never seen any reason for these large bone flaps in operating upon the brain. He had always attempted, in both cerebral and cerebellar abscesses, to operate through a small incision. He classified brain abscesses as those which occasionally recover, and those which never recover. The abscesses which occasionally recovered were those in which a so-called stalk of the abscess could be followed, in which this fistulous, necrotic pathway of infection could be followed up to the brain cavity. Perhaps the majority of such cases would recover. In transportation abscesses, where the infected material was transported through the veins or otherwise to the brain from the suppurating focus in the mastoid, where no pathway could be found, and where one blindly stabbed into the brain, failure to recover was the inevitable rule. One either missed the abscess or, even if it were found, there was such an encephalitis or meningitis from going through or infecting the arachnoid spaces, that recovery was impossible. It was difficult to thoroughly explore the wound in the mastoid in those abscesses situated at a distance from the original area of infection. If therefore, he could not follow the stalk into the abscess he took away a button of bone. He never laid back a flap. He thought it a very bad practice to explore through an infected area. It was a good plan to endeavour to form a plastic inflammation, before going through with an exploratory instrument, by packing the subdural space.

DR. WENDELL C. PHILLIPS congratulated Dr. Murphy upon having the privilege of treating so many cases of brain abscess in so short a time, also upon his large percentage of recoveries. Most of the symptoms or so-called symptoms, of brain abscess were not symptoms of the abscess itself, but were symptoms which came on later, or after the general meningeal symptoms had appeared. Unfortunately, cases of encysted brain abscess presented very few symptoms until rupture of the abscess walls had taken place. Unilateral headache was the one symptom he had always found to be present. He had become suspicious of a severe and persistent unilateral headache in cases of chronic middle-ear suppura-

tion. In many cases it was not severe enough for one to obtain a definite clinical history. He had had a few cases that had impressed him so forcibly that he had come to look upon this type of headache as a symptom of brain abscess. One of these was a young and otherwise healthy student, who weighed 180 pounds. He had chronic suppuration of the middle ear, with an excessive discharge. This discharge was so excessive and so foul that the patient wanted some kind of an operation for it. He did the radical mastoid operation without eliciting the symptom of headache. At the time of operation it was found that there was a dehiscence in the attic, and a few drops of pus oozed from a pin-hole opening in the dura. A large encapsulated abscess was found. On questioning the patient later it was learned that whenever he studied very hard he had severe headache on that side. Another case was one of cholesteatoma with fistula of the horizontal canal. That man complained of incessant headache, but had no other symptoms. He was seen by several *conféres*, including neurologists, but no other symptom could be elicited. Later operation revealed brain abscess. He asked Dr. Murphy what he understood by "large quantity" of pus.

Dr. JOHN F. BARNHILL agreed with Dr. Phillips. There were undoubtedly cases in which it was impossible to make a diagnosis of brain abscess, and these were cases in which there had been suppurative otitis media. The unilateral headache was not present all the time, but appeared some time during the twenty-four hours. Headache was a symptom of nearly every class of brain disease, especially of brain tumour, and it was very difficult to differentiate between brain abscess and brain tumour in which otorrhœa had ceased. There were also the mixed symptom cases, in which there was considerable localized meningitis along with the symptoms of brain abscess. He had seen a case very recently in which the pulse was 55, the temperature 104° F. and in which the type of headache described by Dr. Phillips was present in all its intensity. There had been projectile vomiting, all the symptoms, in short, usually associated with brain abscess. He counted the father's pulse and found it only 59. Slow pulse was probably a family characteristic in this case. He agreed with Dr. Eagleton in the matter of turning down a large bone flap, in order to make a more accurate diagnosis and more thorough evacuation.

Dr. FRANK R. SPENCER said nystagmus, in cases of temporo-sphenoidal abscess, might be absent, as in one of Dr. Murphy's cases, it might come before projectile vomiting, and it might change suddenly. It might occur with the quick component to the right, and then suddenly to the left. This had been emphasized by Ruttin and Neumann. He recalled a case which he and Dr. Murphy had seen, four years ago, in Ruttin's clinic. The patient, a young woman, had nystagmus which changed character twice while the patient was under observation in the clinic. The suddenness with which the quick component changed from side to side was very characteristic of cerebellar abscess.

Dr. J. A. STUCKY said the method of drainage which he had found most satisfactory was that of Sir Victor Horsley, by means of several strips of rubber tubing. Through this rubber tubing the abscess cavity could be irrigated. The use of gauze was conducive not only to the formation of granulation, but to the opening up of areas of infection. The tubing could be removed one piece at the time.

Dr. S. MACCLEN SMITH congratulated Dr. Murphy upon the facility with which he diagnosed and located the abscess formations. In 50 per cent. of his own cases the abscesses were found *post-mortem*. Brain

localisation was one of the most difficult and very often the most unsatisfactory subjects with which to deal, notwithstanding the recent advances in this line. He corroborated what Dr. Pierce had said with regard to making a large opening.

Dr. ARTHUR B. DUEL said his experience accorded with that of Dr. Pierce with regard to the classification of brain abscesses. Those cases in which he had found a "stalk" leading to the abscess cavity had invariably recovered. Where he had found a stalk of entrance he had done very little, except to open up the bone freely to give vent through the naturally made pipe. Perhaps nine out of ten cases of brain abscess reported as cured had been of this type. The unsuccessful cases had been those in which he had been unable to find a "stalk" of entrance. In a number of instances he had located and drained the abscess, but the patient had died from meningitis or encephalitis by extension of the infection. This type of brain abscess would be more successfully treated when otologists learned to employ the technique suggested by Dr. Eagleton, of turning down a large flap and observing the niceties of surgical technique. He emphasised the importance of avoiding puncturing the vessels, as the hemorrhage which would thus take place into normal brain tissue would cause encephalitis or meningitis.

Dr. GEORGE W. MACKENZIE gathered that in many of the reported cases the abscess appeared to develop within a week or ten days after the mastoid operation. In view of the four stages through which an abscess had to pass in its development, he thought this too short a time. Referring to the use of a small knife, such as Dr. Murphy had suggested, he said one might strike the abscess and yet not get pus. He advocated a crucial incision in order to find the pus. It was enough, when the pus began to come faster and faster, to put on the artery clips and dilate the opening. He had known of cases successfully operated in which the patient lived three or four weeks and then died. It was not easy to put in the rubber tube and keep it in place, nor was it always easy to drain these cases as they should be drained. It had been suggested that a brain abscess should be treated as an abscess in any other part of the body; to do this it would be necessary to make a large opening, and curette the abscess cavity *very gently*. This would shorten the duration of an abscess. It was not always easy to locate an abscess. He cited a case in which he had recently been mistaken with reference to a temporo-sphenoidal abscess. The case in question was one that developed in the course of a labyrinth suppuration. Besides the general symptoms common to all brain abscess cases, the focalising symptoms seemed to point to the cerebellum. Upon incising the cerebellum rather freely no pus could be found. It was then decided to open the temporo-sphenoidal lobe, when a large abscess was found and drained. An interesting finding in the case was the presence of a horizontal, wide-excursion nystagmus to the side operated that was not present before the operation. In fact, prior to the operation the patient had a short-excursion rotary nystagmus to the same side. This horizontal nystagmus following the operation must have resulted from the incision made in the cerebellum, and corroborates the claim of Alexander and the speaker that irritation in the cerebellum produces horizontal wide-excursion nystagmus to the same side, in contradistinction to the rotary short-excursion nystagmus found in labyrinthine affections.

Dr. E. B. DENCH thought a bone flap absolutely contraindicated. A brain abscess must be explored through the stalk: failure to find

anything could then be followed by making a flap. An ordinary curved director was better than a knife. He had devised a director in quarter inches, which could be carefully introduced until a free flow of pus was obtained. He then inserted a cigarette drain of gauze, which could be left in place for twenty-four or forty-eight hours, and which would give all the drainage needed. This could be replaced, as the abscess cavity collapsed, with folded rubber tissue.

Dr. SMITH added that drainage of a brain abscess should be through the avenue of infection. All his cases which had recovered had been drained in that way, whereas cases which he had evacuated through decompression had uniformly died.

Dr. MURPHY, in closing the discussion, said he had seen two infections of the middle ear with temporo-sphenoidal abscess. He had brought up this subject in order to emphasize the belief that running ears were more often the cause of brain abscess than had been thought.

Abstracts.

NOSE.

Malignant Disease of the Nose or Accessory Sinuses.—Thomson, StClair.

Advantages of operation through the face (Moure's Operation or Lateral Rhinotomy). Record of two cases with no recurrence after $5\frac{1}{2}$ and $3\frac{1}{2}$ years. "The Lancet," May 13, 1916.

Attention is directed to the recent advance in rhino-laryngology and in particular to the modern methods of nasal surgery which have supplanted the earlier and rougher methods of the general surgeon. The disfiguring and generally useless results of excision of the upper jaw, and of Ollier's or Langenbeck's operation on the nose, are only mentioned to be condemned. A full description is then given of Lateral Rhinotomy (Moure's Operation) including the preliminary preparation of the nose with a cocaine-adrenalin solution and strips of ribbon gauze; chloroform anaesthesia; two post-nasal sponge-plugs; and the drawing forward of the tongue with a tongue clip. As originally designed, two incisions were employed (Fig. 1), starting at the inner extremity of the eyebrow on the affected side and curving outwards and downwards. But later experience shows that a single incision is quite sufficient in the majority of cases. This incision (Fig. 2) starts below the inner extremity of the eyebrow and halfway between the inner canthus of the eye and the centre of the root of the nose. From here it descends along the junction of the nose and cheek to the nasal orifice. If the growth has approached the nostril or is thought to be attached to the floor of the nose, it is well to carry the incision right into the vestibule, so as to detach the lobe of the nostril on that side, as in Fig. 1. But if the growth is in the higher or deeper parts of the nose there is no necessity to carry this descending incision further than the furrow behind the ala naris (Fig. 2). This incision should be planned to lie in the wrinkle which is seen in elderly faces along the side of the nose. This incision is carried down to the bone and, with suitable raspatories, the periosteum with all the soft tissues upon it, is raised and peeled back as far as the line of the bridge of the nose internally, and externally as far as may be necessary towards the malar prominence.

The soft tissues of the face are so lax and pliable that they can be raised and retracted outwards sufficiently to expose nearly all the area illustrated in Fig. 3. This single incision still further minimises the slight scar on the face; it does away with the puffiness of the lower eyelid which, otherwise, may persist for one or two months; there is much less tendency to epiphora; and it should be the only incision to begin with and also in any exploratory operation. The second incision, curving round below the eyelid (see Fig. 1), can be added if required. The single incision can be extended into the vestibule if it is found necessary to detach and raise the lobule of the nose.

The pyriform opening of the nose should be defined, as well as the margin of the orbit, the ascending process of the superior maxilla,



FIG. 1.—Moire's operation. Skin incision as originally employed.

and its junction with the frontal and nasal bone. This latter bone is exposed right up to its junction with its fellow by reflecting the flap of skin, soft parts, and periosteum on the nasal side of the field of operation. With chisel and hammer the bone is now divided along three lines: (*a*) the first divides the nasal bone from its fellow, just external to the site of the nasal septum; (*b*) the second passes outwards from the upper part of this division into the orbit and follows the line of junction of the frontal bone with the nasal and maxillary; and (*c*) the third passes from the lower and outer corner of the pyriform opening upwards and outwards into the orbit (Fig. 2). In this last cut it is well to try and avoid the infra-orbital nerve in its canal. The piece of bone included in these lines is now seized with lion forceps and twisted out. Immediately below it we come directly on the ethmoid region, the antro-nasal partition, and the upper part of the maxillary sinus (Fig. 4). The lacrymal canal should be defined and carefully

retracted under the lacrymal bone. The ethmoid can now be dealt with directly. On plucking it away with some instrument like Luc's forceps we are able to see into the maxillary sinus from above, like looking into an egg-cup. This clearing away of the ethmoid brings the front wall and orifice of the sphenoidal sinus so well into the field that it is now hardly 1 in. distant from the surface, instead of the $2\frac{1}{2}$ to $3\frac{1}{4}$ in. which is the average distance from the anterior nares. This dissection also exposes the roof of the nose. Diseased growth is

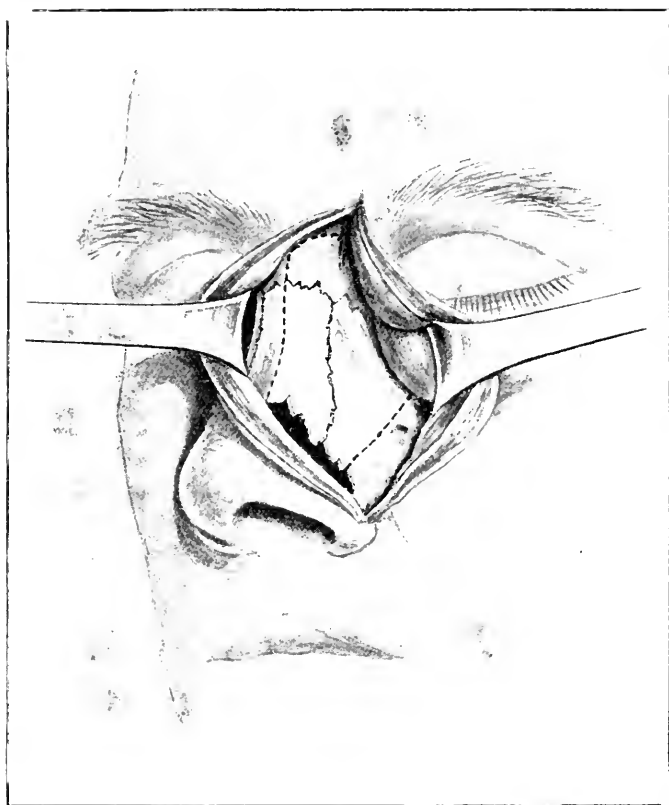


FIG. 2.—Moure's operation. Shows the single incision recently recommended.

attacked with Luc's forceps, conchotomes, sharp spoons, or ring knives, and can readily be followed back into the nasopharynx and sphenoid, outwards into the orbit, and downwards right on to the floor of the nose and the maxillary sinus. If required, the whole of the orbital, nasal, and facial walls of the latter cavity can be removed with bone forceps. If the growth is attacked boldly, and cleared away quickly, the hemorrhage is not alarming. It can be controlled by pressure and packing with 2-in. ribbon gauze, moistened with adrenalin or 5-volume peroxide of hydrogen. Thanks to the two post-nasal sponges there is no trouble with blood descending into the air passages. When the operation is completed and the bleeding arrested the skin incisions are

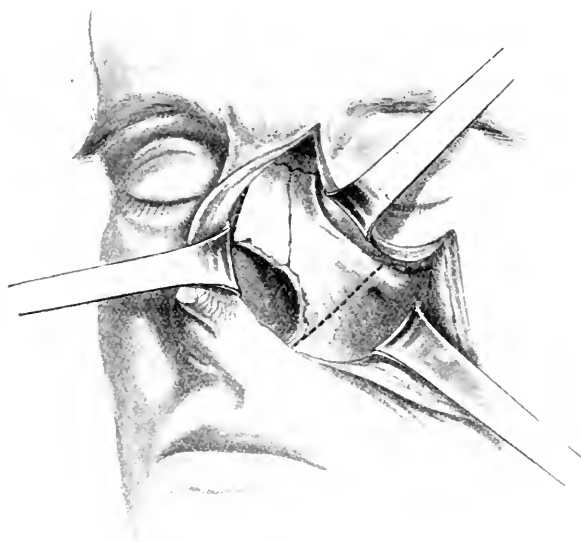


FIG. 3.—Moure's operation. Skin flaps have been retracted, and the dotted lines show where the bones should be chiselled through.

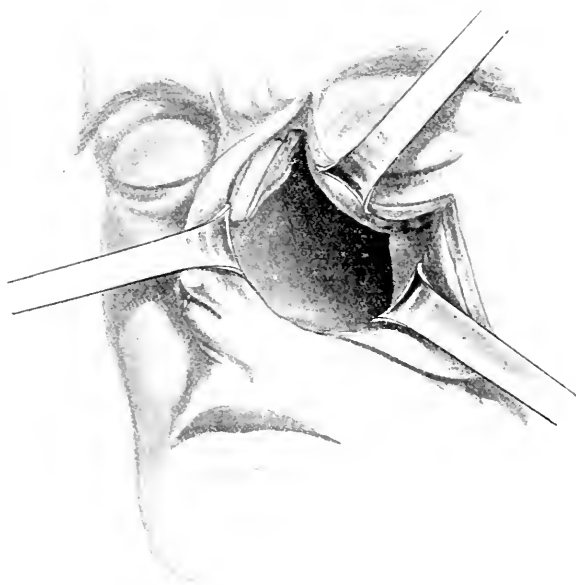


FIG. 4.—Moure's operation. Exposure of the nasal and maxillary cavities through the side of the nose

carefully brought together with silkworm gut or horsehair sutures. The wound may be protected with a pad of dry gauze until the patient recovers consciousness. It is well to dispense with any dressing or plugging inside the nose, and to leave the cavity quite alone for four or five days. If oozing of blood should persist at the end of the operation, a piece of 2-in. ribbon gauze may be packed on to the spot and led out into the nostril through which it is removed within twenty-four hours and not replaced. The post-nasal plugs are, of course, removed before the patient leaves the table.

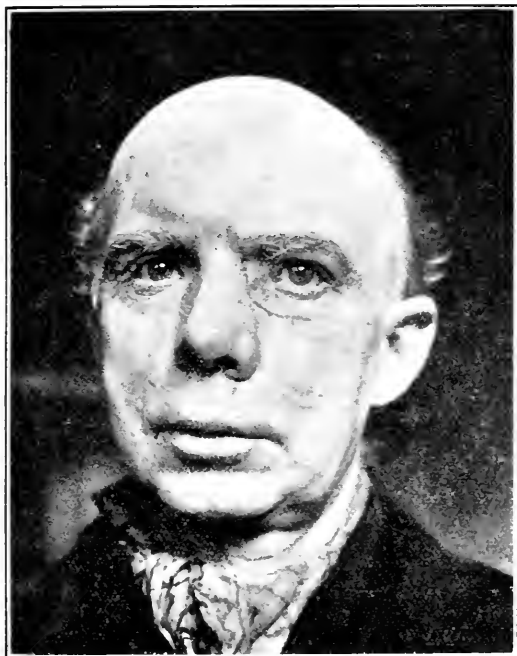


FIG. 5.—Moure's operation. Shows a patient seven days after operation.

Progress.—The writer recommends no dressings on the facial wound which, if exposed to the air, heals up as readily as a shaving cut (Fig. 5).

Results are well shown by photographs and by the patients who have been exhibited before several medical societies (Figs. 5 and 6).

Comparison.—The writer roundly condemns excision of the upper jaw in the following terms: "When the upper jaw is removed for cancer of the maxillary sinus, the antro-nasal wall, the ethmoid, the roof of the nose or the sphenoidal body, it is in the words of Macbeth, a 'most bloody piece of work.' It is chiefly the front maxillary wall and alveolus which are then removed, and this brings the surgeon but little nearer the origin of the growth, for which he has to grope in the dark depths of a bleeding cavity, where hæmorrhage is controlled with difficulty. If he can arrive at the ethmoid region or posterior part of the nasal chamber, it is difficult for him to do more than scrape away

portions of the growth, and it is not therefore surprising that recurrence is almost the invariable rule."

Advantages.—They are stated as follows: "In all cases there is no mutilation or disfigurement. Patients will readily consent to the operation. They are left with an intact roof to the mouth and require no troublesome obturator, as in the old operation of excision of the upper jaw. It is much easier after a Moure operation to keep a direct look-out in the nose and its accessory cavities for any suspicion of recurrence. Recurrences are more easily dealt with, either through the



FIG. 6.—Moure's operation. Shows the scar a few months after operation on the left maxillary sinus.

nasal orifice or by repeating the lateral rhinotomy, and patients are less likely to object to this than to a further facial disfigurement."

Cases.—Two of the author's cases are then related in detail. The first was a case of endothelioma of the ethmoid and antrum, in which there is no recurrence after six years, the patient being now seventy-three years of age, hale and vigorous, and with a good set of her own teeth in the alveolus of the undamaged upper jaw. The second case was one of epithelioma of the left maxillary antrum, in which there is no recurrence after four years. The scar on the face is discernible with difficulty (Fig. 6).

StClair Thomson.

LARYNX.

Œdematous Laryngitis.—Kidd, Archibald. "Lancet," June 24, 1916, p. 1261.

The case was that of a marine fireman, aged twenty-two, who, at 12.45 p.m., showed sudden symptoms of suffocation. He was inverted and a finger stuck down his throat under the surmise of impacted food. He died at 1.30 a.m. *Post-mortem* showed a scar at the tip of the

epiglottis and a small ulcer at the base, extending to the adjoining mucous membrane, with acute cedema of the larynx. No history was obtainable.

Macleod Yearsley.

The Removal of Adenoids.—Aymard, J. L. "Lancet," June 24, 1916, p. 1251.

A long article, somewhat discursive. The author prefers to remove adenoids before dealing with tonsils. In the former he uses curved scissors.

Macleod Yearsley.

ŒSOPHAGUS.

Œsophagostomy for the removal of a Plate of False Teeth.—Bullock, Howard. "Medical Journal of Australia," June 19, 1916.

The plate was lodged in the upper part of œsophagus opposite upper end of sternum. It was *in situ* five days, and could not be removed by direct method on account of defective visibility from swelling. The plate had ulcerated through œsophagus. No stitches were inserted in œsophagus, which was too friable. Only water was given by mouth for a week. By the end of two weeks the fistulous tract had healed completely. Patient suffered no ill after-effects.

A. J. Brady.

EAR.

Psychic Disorders Observed During the War.—Roussy Gustave. "La Press Medicale," April 8, 1915.

Amongst the varied nervous disorders incident to the war, the writer describes three cases of deaf-mutism. Three Zouaves with other soldiers whilst occupying a front trench, were injured by the bursting of a projectile from one of the enemy's mortars, designated by the men "crapouillaud." This form of munition explodes with a terrific crash and gives rise to an extensive displacement of air. A dozen men were entombed under the wall of the trench, two were killed, and others, some of whom were buried up to the neck, were extracted, and led away trembling, and stunned to a dressing station near by. Of the three Zouaves, two had hæmorrhage from the nose and ears, and all of them had been struck deaf and dumb. On admission to the Military Hospital three days later they could neither hear nor speak. At the first examination suspecting hysteria or pure simulation the patients were isolated, and the writer expressed the opinion to his colleague in their presence that they were suffering from nervous shock and promised them a complete return of their faculties by the next day or the day after. On the following day two of them, Arb — and Chaz —, had completely recovered speech and partially their hearing. The other, Via —, commenced speaking on the third day. An examination of the ears by Dr. Chevalier, revealed that Chaz — was suffering from middle-ear suppuration on the right side, Arb — was affected in a similar way, but bilaterally and Via — had suppuration of the left tympanum and a rupture of the right membrane. Hearing was still imperfect, but on a good way to recovery. The author reconstructs the sequence of events in these cases as follows: Bursting of the projectile,

by displacement of air caused a perforation of one or both membranes and induced a violent nervous shock and temporary loss of consciousness. The patients came to themselves, but the auricular lesions, probably exaggerated by the nervous condition of the patients, induced complete bilateral deafness; from this absolute hysterical deafness resulted. These troubles lasted four days. In conclusion, the author says that in these cases the important rôle played by an organic lesion should be remembered. Here it was evident in the production of manifestations of a hysterical order.

H. Clayton Fox.

The Ætiology and Pathology of Otitic Cerebellar Abscess.—Frisner, J.
 "Annals of Otology, etc.," xxv, p. 92.

Discusses 86 cases from literature since 1906: 83-890 were due to chronic suppurations. This is because of the greater base destruction and the presence of cholesteatoma. Males are attacked to females as three to one. The connection between cerebellar abscess and sinus thrombosis is discussed, and also is the difference between abscesses occurring with acute and with chronic otitis. Cerebellar abscess may be labyrinthogenic and nonlabyrinthogenic. At least 50 per cent of the abscesses complicating chronic otitis belong to the former category, but of those due to acute otitis, from 90 to 95 per cent. are nonlabyrinthogenic.

Macleod Yearsley.

MISCELLANEOUS.

Shell Shock.—Wiltshire, Harold. "Lancet," June 17, 1916, p. 1207.

Although not dealing immediately with disturbances of hearing and speech, specialists will find the conclusions drawn in this article to be of value. They are as follows: (1) The wounded are practically immune from shell shock, presumably because a wound neutralises the action of the psychic causes of shell shock. (2) Exposure and hardship do not predispose to shell shock in troops who are well fed. (3) While it is theoretically possible that physical concussion resulting from a shell explosion might cause shell shock, it is certain that this must be regarded as an extremely rare and unusual cause. (4) Chemical intoxication by gases generated in shell explosions cannot be more than a very exceptional cause of shell shock. (5) Gradual psychic exhaustion from continued fear is an important predisposing cause of shell shock, particularly in men of neuropathic predisposition. In such subjects it may suffice to cause shell shock *per se*. (6) In the vast majority of cases of shell shock the exciting cause is some special psychic shock. Horrible sights are the most frequent and potent factor in the production of this shock. Losses and the fright of being buried are also important in this respect. Sounds are comparatively unimportant. (7) A consideration of the causes and frequency of relapses favours an original cause of psychic nature. (8) Any psychic shock or strain may cause a functional neurosis, provided it be of sufficient intensity relative to the nerve resistance of the individual. Such shock or strain need not have any connection with "sex complexes."

Macleod Yearsley.

REVIEW.

The Catarrhal and Suppurative Diseases of the Accessory Sinuses of the Nose. By ROSS HALL SKILLERN, M.D. 287 illustrations. Second edition; thoroughly revised. Philadelphia and London: J. B. Lippincott, Company, 1916. Price 21s. net.

The rapid exhaustion of the first edition of this book, which was reviewed in the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY for July, 1914, is sufficient testimony to its popularity, and we are pleased to be able to congratulate Dr. Skillern upon the success he has obtained.

This second edition has been "thoroughly revised," but it still contains the ambiguous phrasing in the description of the anatomy of the sphenoidal sinus to which we took exception in our former notice (p. 363 of the present edition).

A strong point in the book is the account of operative method and technique, and the figures illustrating this portion of the text are, on the whole, quite useful. The author exercises caution in expressing preferences for particular varieties of technique, and wisely so, since opinion on these matters is still fluid. In one direction, however, his views seem to run counter to those of most modern rhinologists, at all events in England, and that is with regard to the Killian operation on the frontal sinus. In this country that operation is nowadays confined to cases where some special complication seems to demand it, as in uncomplicated frontal sinus suppuration our results have been, to put the matter mildly, discouraging. Perhaps if Dr. Skillern had been able to grant a little more space to recent work on spreading osteomyelitis he might have been in a position to understand this attitude, if not to sympathise with it.

One deficiency in the book consists in a scantiness of information as to the end-results of operation. It may be true that certain operations are ingeniously devised to fulfil the ends of curettage and drainage, but what we all want to know is, do curettage and drainage lead to cure. And if they do not, then what further steps can be taken to reach this desirable end? Again, in the conflict and hesitation manifested in the minds of all experienced rhinologists at the present moment between intranasal and external operation upon the sinuses, what we see is in reality the result of a doubt as to the actual necessity for curetting the walls of a sinus. Is this curettage always necessary? And if it is not always necessary when may it be dispensed with, and confidence placed upon free drainage and ventilation alone?

Such are a few of the problems of nasal sinus suppuration upon which we should have liked Dr. Skillern's opinion.

In other respects this edition carries out and amplifies the method and arrangement of the first. We were unable to find any omission in the long list of operations and modifications of operations on the maxillary antrum and on the frontal sinus, and pretty well every author who has made any suggestions or change of technique has received honourable mention. But, as we have already said, the questions that leap to the mind of every practising rhinologist when he is thinking over his own experiences receive in Dr. Skillern's book little or no attention, still less emphasis. And yet it is here that the whole problem of the treatment of nasal sinus suppuration is contained.

We heartily support the author in his recommendation of the naso-

pharyngoscope in intranasal diagnosis. Rhinologists have been curiously slow in making use of this instrument, an indispensable aid in the diagnosis of disease in the posterior regions of the nose.

Dan McKenzie.

NOTES AND QUERIES.

COL. A. D. SHARP, C.M.G.

We are pleased to observe that Col. A. D. Sharp, Surgeon to the Ear, Nose, and Throat Department, Leeds Public Dispensary, who has been in France since the beginning of the war, has been awarded the honour of C.M.G.

EPISTAXIS.

"I regard epistaxis in middle-aged and elderly people as very suggestive of high tension. It is a symptom which requires careful investigation, and it may be the first intimation of a condition of the vascular system leading to a cerebral hemorrhage."—Dr. de Havilland Hall, *Medical Press and Circular*, March 14, 1917.

TONSILLITIS AND HAND INFECTIONS.

Mock (*Surgery, Gynecology, and Obstetrics*, October, 1915) writes on the treatment of hand infections from an economic standpoint, based on a study of 1600 cases, among stockyard workers, etc. Predisposing causes, such as anæmia and chronic disease, are taken into consideration. Mock finds that tonsillitis, one of the chief causes of sick disability among the workers, likewise plays a marked part in the cause of hand infections. In the winter months, when tonsillitis is most prevalent, infections are correspondingly high in the stockyard. Coincidence of tonsillitis and finger and hand infections was noted so often that Mock made bacteriological researches and found that as a rule the same germ was found to be the cause of both. In January and February, 1913, there were 327 cases of tonsillitis and 83 of hand infections. The total number of days of disability from hand infections was 63, and the number of hand infections associated with tonsillitis ("at time or just before infection developed") was 15—that is, 18 per cent. In 1914 an epidemic of streptococcal tonsillitis occurred in Chicago. The total number of cases of tonsillitis under Mock's observation in January and February of that year was 603, and the total of hand infections 117. The total days' disability from hand infections was 208. The number of hand infections associated with tonsillitis was 32, or 27.9 per cent. This greatly increased disability in 1914 was due to 24 very bad cases with marked lymphangitis and tenosynovitis, and Mock is careful to note that all had tonsillitis; 12 were traced to a hæmolytic streptococcus, and the same germ was found in the patient's tonsils; 12 others had a marked lymphangitis, and though the organism was not ascertained, yet the infections were undoubtedly streptococcal and closely related to the tonsillitis.

THE EVOLUTION OF THE NOSE.

"At present no light seems to have been thrown on the evolution of the nose. In a new-born infant there is (we fear) a distinct resemblance to the short, broad, snub, with its wide nostrils, of the negrito. The aquiline nose is characteristic of the Jewish race, of many Australians, and certain Indians who live in the high plateaux of Peru; but there has been, so far as the author is aware, no attempt to explain it as a modification due to atmospheric conditions."—G. F. SCOTT-ELLIOT, "Pre-historic Man and His Story," 1915, p. 100.

BOOK RECEIVED.

Cerebellar Abscess: its Ætiology, Pathology, Diagnosis and Treatment.

By *Isidore Friesner, M.D.*, and *Alfred Braunn, M.D., F.A.C.S.*
Price 12s. 6d. London: William Heinemann, 1916,

THE
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**THE CAUSATION AND PREVENTION OF EDUCATIONAL
DEAFNESS.**

BY MACLEOD YEARSLEY, F.R.C.S.,

Otolologist to the London County Council Deaf Schools: Lecturer and Examiner
to the Training College for Teachers of the Deaf, etc.

(*Continued from p. 125.*)

II. ACQUIRED CASES.—A careful analysis of the acquired cases (1209 in number) succeeded in eliminating many doubtful causes of deaf-mutism, such as "teething," "fright," "shock," and the like. Those which could not be definitely disentangled from these vague (but, apparently, time-honoured) causes have been classed as "doubtful."

It is in the group of acquired cases that so much can be done in the future by the otologist. The prevention of congenital deafness belongs more to the social reformer, the legislator, the hygienist, and the eugenicist.

The Infective Diseases.—In the 408 cases in which an infective disease could be assigned definitely as a cause, I have endeavoured to ascertain in what way the deafness resulted. I am aware that epidemic cerebro-spinal meningitis should be included in this class, but I have placed it with the other forms of meningitis as more practically convenient.

1. *Varicella.*—In the 2 cases the deafness was due to middle-ear suppuration.

2. *Diphtheria* was responsible for 20 cases. In 5 the deafness was due to middle-ear catarrh, in 11 to middle-ear suppuration. In 2 it resulted from meningitis, and in 1 there was an internal ear deafness without any history of meningitis.

3. *Enteric Fever*.—The 2 cases were both deaf from internal ear disease, in 1 of which there was a history of meningitis.

4. *Rötheln*.—1 case, due to middle-ear catarrh occurring during the attack of German measles and neglected after.

5. *Influenza*.—Of 4 cases, 1 was due to middle-ear suppuration, 3 to attacks of meningitis during the influenza.

6. *Measles*.—Out of 130 cases, 22 were deaf from middle-ear catarrh, 60 from middle-ear suppuration, and 48 from meningitis.

7. *Mumps*.—2 cases, both of internal ear deafness.

8. *Pneumonia*.—27 cases. In 2 the deafness was due to middle-ear catarrh, in 5 to middle-ear suppuration, and in 20 to meningitis.

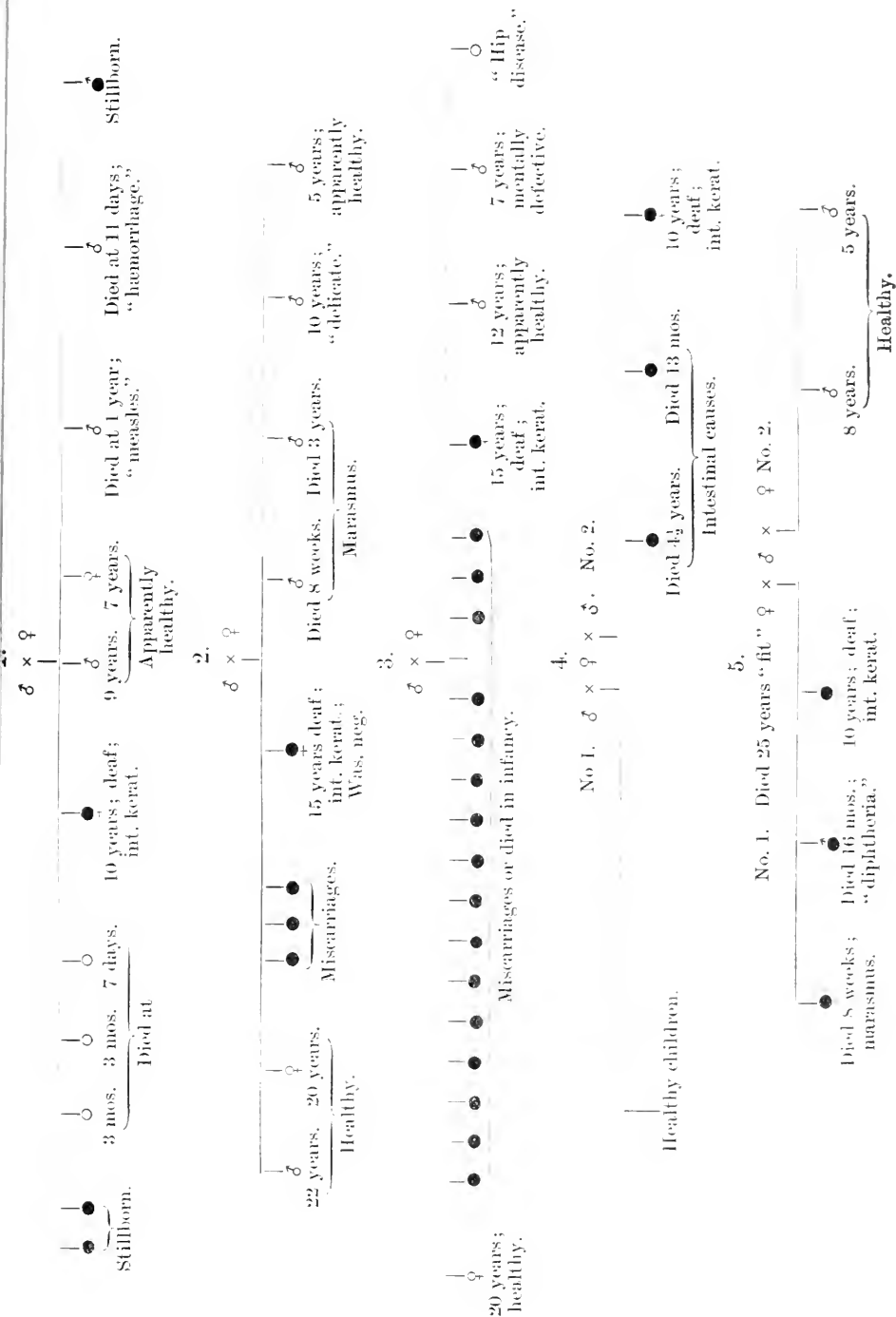
9. *Rhenmatic Fever*.—The 2 cases were deaf from internal ear trouble, 1 being definitely associated with high temperature during the acute rhenmatic attack.

10. *Scarlet Fever*.—112 cases. Of these, 7 were deaf from middle-ear catarrh, 97 from middle-ear suppuration, and 8 from meningitis.

11. *Congenital Syphilis*.—80 cases, giving a percentage of 6·6 of all cases of acquired deafness. This is a heavy one when compared with that of 2·5 given for Paris by Castex (*Bull. et Mém. de la Soc. Franç. d'Oto-Rhino-Laryngol.*, 1908), and illustrating the grave necessity for a rational and *systematic* dealing with this disease in England. The Wassermann reaction was obtained in 10 cases only, and found to be negative in 6, positive in 4. Every case, however, showed undoubted characteristics of the disease. In a large number of these I was able to obtain the family histories. The inclusion of all of them would take too much space, but the following 5 (see p. 147) are interesting as specimens.

Nos. 4 and 5 are of special interest as showing two families in each: in No. 4, by one woman, of a syphilitic and of a healthy father; in No. 5, by one father, of a syphilitic and a healthy mother.

12. *Tubercle*.—In only 10 cases could tubercle be assigned as a cause. In 7 the deafness was due to middle-ear suppuration, and in 3 to meningitis. The small number of cases is probably due to the fact, as I have pointed out elsewhere (*Lancet*, July 20 and 21, 1912), that tuberculosis in children tends to kill before school age.



13. *Pertussis*.—15 cases were the result of whooping-cough; of these, 2 were deaf from middle-ear catarrh, 7 from middle-ear suppuration, and 6 from internal ear involvement.

It will be noted that, of the infective diseases, five stand out prominently in the numbers of their victims. Measles claims 130, scarlet fever 112, congenital syphilis 80, pneumonia 27, and diphtheria 20—a total of 369 out of 408 for all the infective diseases, or 90·4 per cent. I think it can be shown that in the majority of these the deafness could be prevented. Moreover, the incidence of four out of five of the primary diseases could be materially reduced.

Diseases of the Nervous System claim 188 cases, 3 of which were due to hydrocephalus. Of the remaining 185 (15·3 per cent. of all acquired cases), meningitis was responsible for the deafness. Kerr Love has pointed out that educational deafness in children, other than deaf-birth, falls into three great groups of causes—the infective diseases, meningitis, and primary ear disease. Of these, meningitis is the most difficult to deal with from the point of view of prevention, because it owns such a variety of causes, and requires special and painstaking research before it can be grappled with successfully. I have, therefore, endeavoured to ascertain the causes of the meningitis in these cases, with the following results:

30 were undoubtedly traumatic in origin, 26 being due to “falls on the head,” 3 to “blows on the head,” and 1 to “an accident (nature uncertain).”

In 2 cases the doubtful cause of “teething” was given.

In 2 cases there was presumptive evidence of congenital syphilis (in 1 the Wassermann reaction was negative).

The remaining causes were: Epidemic cerebro-spinal meningitis, 8; influenza, 2; enteric fever, enteric and pneumonia, enteric and scarlet fever, endocarditis, and sunstroke, 1 each.

But to ascertain accurately the number of cases in which meningitis was the direct cause of deafness, we must add to the above those of the infective diseases just discussed in which meningitis occurred. These were:

Diphtheria	2	Pneumonia	20
Enteric	1	Scarlet fever	8
Influenza	3	Tubercle	3
Measles	130		

making a total of 85 additional cases to be added to the 185 cases under discussion—a grand total of 270, or 22·3 per cent. of the whole number of acquired cases. Of these 270 cases, in only 97,

or 35.9 per cent., could the original cause of the meningitis be determined—a result that strengthens the persistent call made by Kerr Love and myself for research into the causation, bacteriology, and treatment of meningitis with a view to its prevention. Moreover, it is not only in regard to deafness that this work is urgent. Meningitis is one of the most serious conditions which attack children. It literally kills or maims thousands of little ones every year. In the annual summary of marriages, births and deaths for England, Wales, and London in 1912, the *deaths* from meningitis in London alone (p. 44) during that year was: Tuberculous meningitis, 668; epidemic cerebro-spinal meningitis, 4; simple meningitis, 382; “convulsions,” 533; total, 1587. When the country has passed successfully through the present great crisis she will be called upon to face the upbringing of as many fresh citizens as possible to replenish the man-power of the State; and the question of meningitis is not the least of the many problems involved.

In regard to *epidemic cerebro-spinal meningitis*, I would point out that in the 8 cases recorded here the deafness was total. The number is a decided increase, owing to recent epidemics, for the percentage of all acquired deaf cases is 0.66, as against 0.16 in an analysis made by me in the *Lancet* in 1912.

Primary Ear Disease is answerable for 448 cases of acquired deafness, or 37.04 per cent. This group includes those cases of catarrhal and suppurative middle-ear disease which did not owe their origin to any of the causes already given. Two cases are also included of otosclerosis, one boy and one girl; both of these cases had been seen by well-known otologists, and showed hospital certificates certifying them as suffering from that condition.

The chief interest of the cases in this group centres round their causation, investigation of which gave the following results:

Middle-ear Catarrh.—Out of 232 cases, 131, or 56.2 per cent., were definitely due to the effect of adenoids. It was noteworthy how frequently the history was given that (1) adenoids had been removed more than once, and (2) that an operation for adenoids was followed by an increase in the deafness.

Middle-ear Suppuration.—Out of 214 cases, 55, or 21 per cent., were due definitely to adenoids. One case was said to be due to “tonsillitis” and 4 to “injury” (1 to “injury at birth”).

I would point out that every case of middle-ear deafness seen was investigated as to cause, and all those which could be traced to an infective disease were included under that group. It is nearly always difficult to obtain reliable histories in school medical inspec-

tion work, and it is possible that some of the cases now under review originated in scarlet fever, measles, or other infective disease. The results I give are, however, as reliable as careful investigation could ensure.

The question of suppurating ears in schools is a very serious one, and I shall return to it in the second part of this paper.

Other Causes.—This group comprises cases in which the deafness was due to *injury*. Of these there were 70 cases. Those in which injury was definitely known to have resulted in meningitis (of which there were 30) are classified under the latter heading. The nature of the injury in the 70 cases was given as "falls on the head," 51; "blows on the head," 7; "run over," 4; 8 cases gave a definite history of cerebral concussion.

III. DOUBTFUL CASES.—There were 95 cases in which the evidence as to the cause was either wanting or of so slender a nature as not to warrant inclusion in any of the groups above discussed. Some of the cases are those of children only recently seen or admitted to deaf schools, and many may be cleared up by later investigation. Eleven of the 95 were possibly born deaf; in 3 there was a history of "fever," the nature of which could not be ascertained; 1 was possibly a case of meningitis; in 5 the cause given was "shock" or "fright"; and 2 had been severely burned (1 of these showed an enlarged thyroid gland, with a cretinous facial aspect).

The above analysis is useful because it shows the importance of careful and repeated consideration of each case, and of not accepting without investigation the statements given by parents. Take, for instance, the causes originally given for 39 of the congenital syphilitic cases, which were: Unknown, 21; fall, paralysis, inflammation of the brain, improper medical treatment, 2 each; chorea, whooping-cough, blow, nerves, tuberculosis, consumption, chicken-pox, broken leg, weakness, run over, 1 each. Adequately to investigate and to differentiate the various causes of educational deafness, opportunity is required in every school medical inspection department to obtain reliable medical histories and for the conduction of laboratory investigations. Much might be achieved by the reciprocal action of hospitals, infirmaries, workhouses, asylums, and education authorities.

II. THE PREVENTION OF DEAFNESS IN INFANCY AND CHILDHOOD.

Deafness has been taken lying down by the profession and the laity for too many years. It is time that this was realised in order

that means for prevention can be instituted. In the statistics issued by the Census authorities no account is given of the numbers who have become deaf in childhood, youth, young adult, and later life. When it is realised what an enormous loss of otherwise serviceable citizens this means to the State, a loss which is enhanced by the present crisis in the country's future welfare, the argument for prevention comes home with greater force. The majority of otologists must be fully aware of the direction in which the prevention of deafness lies, but it needs a great movement, in which the laity must take part, to give the necessary stimulus for prevention to be carried out. Would that that stimulus were given by otology!

In dealing with the prevention of *hereditary deafness*, the questions to be considered are mainly social and educational. One must, however, go further, and point out that, amongst families showing hereditary deafness, there are those who show that defect alone, and those who show it in conjunction with mental deficiency, imbecility, or epilepsy. It sounds, perhaps, Utopian to say that the latter class should be prohibited from marriage altogether—a prohibition which should include those members of the family who are apparently healthy, since they are likely to be carriers of the recessive characters. At the present state of our social evolution it is difficult to interfere with apparently sound individuals, and we must be content for the moment—inadequate as it may be—to use repressive measures with those who show the recessive character in their persons, feeling that, as more is known upon the subject and we can speak with more authority upon matters of heredity, we shall take more care in the breeding of our future citizens. With advanced and certain knowledge, the wider prohibition will surely prevail in the future. To this end the segregation of the mentally defective and epileptic deaf for the whole of their lives is important; the machinery for it we already possess in the Mentally Defectives Bill. The past two years has opened the eyes of many to the stupidity of government by lawyers who, however long they may “wait,” cannot “see” beyond their noses, and are blinded so much by professional aggrandisement.

As regards those who exhibit hereditary deafness alone and uncomplicated the matter is somewhat different, and, possibly, capable of easier solution under present conditions. The segregation of the deaf in residential institutions and their acquisition of a language, that of signs, which can only be understood amongst themselves, or by a limited number of hearing persons who pass

their lives amongst them—certainly not by the general community—is a grave defect in deaf education, for it is one which must lead inevitably to the intermarriage of deaf persons. What is required is that the deaf should associate more with hearing persons and less with one another, and that by means of lip-reading and speech taught by the oral method, they should be able to communicate with their hearing fellows. To this end the day-school system and instruction by the oral method must be made more universal. There are persons, happily diminishing in number (as reactionaries generally do in the face of progress), who would make of the deaf a class apart. Such persons are doing a grievous wrong to the very class they believe they are benefiting, for they deprive the deaf of free intercourse with the hearing, and force them to intermarry in their quest for sympathy and family life.¹ Until these defects in the social welfare and education of the deaf are remedied, it is unfair to expect intermarriage between deaf-born persons not to take place.

The question of the prevention of *sporadic deaf-birth* is, as I have already pointed out, one for the social reformer, the legislator, the hygienist, and the eugenist. Overcrowding, parental neglect, alcoholism and the like are the matters which must engross their attention. The otologist can only help them by his support. The medical profession must see to it that syphilis is efficiently discovered and treated. In the medical departments of educational bodies every facility for laboratory research and the sifting of all cases of so-called deaf-birth should be provided.

It is, however, in the province of *acquired deafness* that the otologist can do so much, provided he realises steadfastly and unceasingly his obligation to the State. This is, to my thinking, twofold, consisting of the prevention of potential deafness, and the treatment of diseases of the ear with (save in the case of actual saving of life) the primary intention of preserving hearing.

Let us take the three classes—infective diseases, meningitis, and primary ear disease—and see what indications they can give for better prevention of deafness.

In 9 exanthematous diseases there were 288 cases, of which

¹ It has been pointed out to me that no eugenic advantage would be attained this way, because it would lead to the production of a large number of heterozygous persons with deafness latent in them, who, in the not unlikely case of their intermarrying, would provide some deaf-born children. I quite admit this, but, until better means can be found, this would probably ensure a reduction in the total numbers of deaf-born persons, because recessives would have no opportunity of "breeding true."

178, or 61·8 per cent., were deaf from middle-ear suppuration; 37, or 12·8 per cent., from middle-ear catarrh; and 62, or 21·5 per cent., from meningitis. The great preponderance of middle-ear suppuration is strongly suggestive of inadequate care of the ear, nose, and throat in our fever hospitals. Every otologist knows how much can be done to prevent ear complications during the course of the infectious fevers. The important papers of Gordon (*Trans. Otol. Soc.*, vol. vi, p. 120, and vol. viii, p. 103) demonstrate it. When such complications do occur, skilled treatment goes very far to prevent their destroying the hearing, and, when the mastoid operation becomes necessary, due care will, in the majority of cases, lead to the conservation of useful hearing. That otologists have recognised the value of skilled treatment of the ears in fever hospitals is shown by the resolutions that have been sent up by them officially from time to time, pointing out the urgent need for the appointment of specialists to the staffs of these institutions. Such resolutions should be persisted in. Government bodies are difficult to move, and most changes depend more upon the effect of such changes on party votes, and it is only by making a persistent and organised attack that otology can get its own way in this matter.

Meanwhile, there is ample scope for research in the genesis of ear complications in the exanthemata, and especially bacteriological research. No doubt a time will come when scarlet fever, diphtheria, measles and the like will be stamped out as smallpox has been. Reference to Mygind's work upon "Deaf-mutism" (p. 123) will show that, in 1848, variola was responsible for 22·2 per cent. of cases, and in 1882 for 0·0 per cent. I have met with no cases, but at the Margate Royal School the statistics of 1076 cases from 1880 to 1910 showed one instance. Progress in preventive hygiene may bring the percentage of other infectious fevers down in the same way; until then it is the duty of otologists not only to clamour for the prevention or effective treatment of these ear complications, and to see that they get it, but also to insist upon the better instruction of the general practitioner in otology. Recently a thoughtful paper appeared (*Arch. of Pediat.*, 1916, vol. xxxiii, p. 434) by J. A. Colliver on "Obscure Manifestations of Otitis Media in Infancy and Childhood." Not himself an otologist, he feels that the burden of responsibility for the number of cases of ear disease in childhood which are neglected, overlooked, or wrongly diagnosed rests upon the general practitioners. He lays stress upon the not infrequently obscure nature of the symptoms of

otitis media, as well as upon the often unnecessary mastoid operation, and he discusses the ætiology of ear disease in infancy, with special reference to scarlet fever, measles, and influenza. His paper provides food for reflection, not only for general practitioners, but for otologists as well.

Now as to *meningitis*. I have endeavoured to show that 270 out of 1209 cases of acquired deafness owed their condition immediately to meningitis; 22·3 per cent., nearly a quarter of the total. Of these, in only 97, or 35·9 per cent., could the original cause of the meningitis be determined. This calls for research into the causation and bacteriology of meningitis, with a view to treatment, both curative and prophylactic. Here, again, is an opportunity for otology to move. With a full knowledge of the frequency of meningitic deafness, and especially of its absolute hopelessness as regards treatment, every otologist must agree that, if prevention is the true aim of medicine, it is his duty to urge, at every opportunity, the employment of all means which will make for the prevention of meningitis and of the deafness which may arise from it.

Lastly, let us turn to the question of educational deafness from *primary ear disease*. The number of cases was 448, or 37·04 per cent. With two exceptions (instances of true otosclerosis), these were all suffering from middle-ear suppuration or advanced catarrhal middle-ear disease. I need not repeat what I have already said concerning them, but I would point out the lessons that they teach. These lessons fall into three groups: the prevention of the causes which lead to primary ear disease; the prevention of such disease; and the treatment of such disease when once established.

1. The prevention of the causes leading to the deafness of the cases under discussion is largely the prevention of infection of the naso-pharynx. In a great number of instances it resolves itself into the perennial question of adenoids. Out of 232 cases of non-suppurative middle-ear deafness, 132, or 61·2 per cent., could be definitely ascertained to be due to adenoids; whilst in the 214 middle-ear suppuration cases, 55, or 21 per cent., similarly originated. That is to say, adenoids were responsible for *at least* 41·9 per cent. of the cases of primary ear disease. Probably the percentage, could one have retained reliable histories in the remaining cases, would have been a much higher one.

Much has been written upon the ætiology of adenoids, but, if one boils it all down, it resolves itself largely into two main facts:

faulty environment and infection. The conditions under which the children of the poor exist in our large cities are eminently fitted for the production of adenoids. I would recommend to the student of prevention, Hector Cameron's paper on "The Reaction of the Child to a Faulty Environment" (*Practitioner*, 1916, xvii, 61). Cameron insists upon the great frequency, among the children of the poor, of catarrhal infections of all sorts, and that it is due to the evil effects upon the organism of a faulty diet and a faulty environment. The tendency to catarrhal infections is a special characteristic of childhood, and even of healthy childhood. This commonest of catarrhal affections in the children of the poor is such that a considerable percentage show, after death, lymphatic enlargement (save after long illness). Although "status lymphaticus" may be the reason for sudden death without adequate cause being patent *post mortem*, many such deaths are undoubtedly due to lowered resistance to infection. Cameron points out that out-patient children, though catarrhal, may often be plump, rounded, and high-coloured. On examination, however, there can be found a host of manifestations indicative of lowered resistance. A second group of children is pale, undersized and wasted, with intractable secondary dyspepsia; the children who have suffered a constant repetition of catarrhal affections. One paragraph of this paper is especially worth quoting: "For some years, I have felt convinced that the *post-mortem* appearance, to which the name status lymphaticus has been applied, is found only in children who have exhibited this fictitious appearance of health with persistent, though quiescent, catarrhal infections, and who have met their death without preliminary wasting or dehydration of the body." No name has yet been applied to the conditions which Cameron describes, and he suggests the expression "catarrhal state." In discussing ætiology, three factors are considered—heredity, faults of hygiene, and faults of diet. Confinement to hot rooms and a town life are important causes. Air-borne respiratory infections are very common, even in hospitals, and something is to be said as to the evils of the "hospitalising" of infants. Among faults of diet, artificial feeding, and excess of one constituent (generally sugar or starch) in the food are prominent. In conclusion, Cameron draws attention to the relation between the "catarrhal state" and rheumatism and tuberculosis.

As regards the effect of artificial feeding in the genesis of adenoids, Barraud, of Lausanne ("Les Oreilles de nos Enfants," Lausanne, 1912, p. 9), has pointed out that the improper artificial

feeding of infants is a potent factor, but he is inclined to regard this as due to the fact that the infant develops its nasal chambers better when suckling naturally. There has always seemed to me a weak spot in his argument, and Cameron's remarks on the "catarrhal state" explain it better.

If faulty hygiene, faulty diet, and air-borne infection are the true factors in the production of adenoids, we have a clear indication of the lines upon which their prevention must be based. *It cannot be too strongly realised that the beginnings of primary ear disease must be sought and treated in the pre-school age.* School medical inspection has done a great deal, but some of the problems it has to solve are tackled too late. As preventive hygiene progresses, these problems will be more efficiently met before the child comes under the school doctor's care, and he will be concerned more with the healthy child and his maintenance in a healthy condition. No greater truth stands out in the present crisis than that *the child is the living future*, and upon that truth any *Ministry of Public Health must stand and act.*

There is much food for thought and action in the paper on "The Physical Welfare of Children after Infancy, from the National, Social, and Public Health Standpoints," read by Leslie Mackenzie at the Royal Sanitary Institute on January 31, 1917. He says: "It may be safely assumed that the case for the medical superintendence of the pre-school child is as completely established as the case for the medical superintendence of the school child himself."

Among the many points dealt with in this paper is one which has a special bearing upon the genesis of adenoids. In Edinburgh has been established, to remove the serious handicap of infant care on the over-pressed mother, a "Toddlers' Playground." This is a sufficient open space, "with the usual infant properties of sand, rocking-horses, etc., and an open-air shelter for the rainy days." The results have justified the experiment, and the paragraph to which I would specially draw attention is this: "One test of the health improvement has been noted by the medical man in attendance. It is that the 'running noses,' so commonly incidental to the life of the children, have spontaneously disappeared. From this fact many important inferences could be drawn; but one broad inference is enough, namely, that the stimulus of the cool air, the process of preparation of the playground, the transference to it, the two hours' occupation of it, and the transference home, all result in a generalised improvement of nutrition and a toning up of

the whole tissues." But there is a further meaning to it—a step towards the prevention of adenoids.

It would drag this paper to undue length to discuss in detail the means at disposal for improving the upper air-passages of the pre-school child. Some of them may, however, be briefly enumerated as—the education of the general practitioner in otology and the realisation of the possibilities of prevention; the more extended establishment of infant clinics, infant consultations, schools for mothers, and the like, all of which do a great deal of good work, but do not, as yet, do enough for our children's ears; and the establishment in all our great cities of "toddlers' playgrounds" similar to that described by Mackenzie. If a Ministry of Public Health is to be established in the endeavour to counteract the ravages of the past two years, otology, or, rather, *preventive* otology, should be represented upon it.

2. The prevention of ear disease, when once the potential cause of adenoids and the catarrhal state is present, next claims attention. In the cases which I have analysed in this paper as those of deafness due to primary ear disease, it was a noteworthy fact that one frequently found two statements volunteered: (1) that adenoids had been removed more than once; and (2) that an operation for adenoids had been followed by an increase in the deafness. These statements suggest that there is something radically wrong in the operations done, or in the after-treatment, or in both. In some cases examination established the fact that the adenoids had not been efficiently removed. The great majority of these cases had been operated upon at large general hospitals; those which had been treated at special hospitals were in a great minority. The result of inquiry often suggested that, in many instances, the removal of the adenoids seemed to have been the only aim of the operation, and that, where the enlarged pharyngeal tonsil had infected the nasal passages, no means had been suggested or taken to cure the latter, and so prevent a later reinfection of the nasopharynx. One realises the enormous pressure of adenoid cases at hospitals, but there is no reason why organisation should not overcome defects of administration, and consequent discredit of a valuable operation. Probably a good deal of blame rests with the ignorance of parents, but it is difficult not to assume that some of it lies with the surgeon.

3. The treatment of ear disease, once established, must be divided into the treatment of suppurative and non-suppurative middle-ear conditions. Are the suppurating ears of childhood

always treated as they should be, and, above all, are they always treated with due regard to the preservation of function? The cases one meets with in deaf schools suggest a reply in the negative. Medical journals are always publishing papers on the treatment of discharging ears; many of them contain valuable suggestions, but signs of their being carried out are not always visible. The children of the poor are bad subjects for middle-ear suppuration, because they are so frequently reinfecting their ears from their upper air-passages. They are the *bête noir* of out-patient departments, and the persistent attendants of school treatment centres. The main points about their management lie in two directions: (1) It is useless to attempt to check a discharging ear by local measures so long as reinfection from the nose is apt to occur; and (2) the original expectations of the radical mastoid operation have not been realised, *i. e.* the operation does not cure every case. Probably, as Bardes puts it (*Med. Record*, vol. xc, 1916, p. 588), in children it is better whenever possible to do a simple opening operation, as more likely to preserve hearing, whilst obtaining effective drainage.

With regard to the treatment of catarrhal middle-ear deafness, the difficulties seem even greater than with suppuration. One thing seems needed, and that is a better after-treatment of adenoids. Here, again, the blame lies often with the parents, and the over-pressure in out-patient departments adds to the difficulties. It were better if children were not mixed up with adults in aural clinics. Better still would be the appointment of otologists to the care of school treatment centres, where only school children are dealt with.

The defective hygienic surroundings of many of our school children must bear a part of the blame. Better housing, better sanitation, and better feeding would all contribute to better results in the treatment of ear disease in children.

The length of this paper has forced me to deal as briefly as possible with its subject; I have endeavoured rather to indicate than to go deeply into details. If I have succeeded in drawing the serious attention of otologists to the problems connected with the deaf school child, much of my object will have been accomplished. I have tried throughout to show how much work is needed in the province of prevention, and what might be achieved thereby.

VINCENT'S DISEASE OF THE EXTERNAL EAR OCCURRING IN THE COURSE OF CHRONIC MIDDLE-EAR SUPPURATION.

By R. P. MATHERS, M.D.,

Surgeon, Ear, Nose, and Throat Department, Dundee Royal Infirmary; Lecturer on Diseases of the Ear, Nose, and Throat in the University of St. Andrew's.

CASES of Vincent's disease occurring on the usual site, the tonsil, have not been uncommon during the past two years. As it is unusual to find the lesion on the skin surface, this case may be considered worthy of record.

A girl, aged seven, was referred to the Out-patient Department with a history of pain in the ear of three weeks' duration. The ear had been discharging for six months, but no advice was sought until the onset of pain, when it was noticed that the skin of the meatal orifice and of the concha of the affected ear was very injected and moist.

On inspection the meatus was seen filled with purulent secretion; on the inflamed skin there was a thin, almost translucent film, greyish in colour, having a very definite irregular margin. This film was limited to half the area of the concha, and extended a little way into the meatus. Its margin here could not be defined owing to the presence of pus and the extreme tenderness of the auricle. Its appearance was so suggestive of diphtheritic membrane that a swab was taken for diagnostic purposes. Vincent's spirilla and fusiform bacilli were found in abundance.

The child was admitted to the ward, boracic acid fomentations were applied, and in two days the membrane had entirely disappeared. As the irritation of the skin persisted a dressing of salicylic ointment was substituted. A radical mastoid operation was performed a few weeks later, no unusual features being noted.

During the child's stay in hospital there never was any elevation of temperature. There was an offensive odour, probably due to the neglected middle-ear suppuration. In the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY (December, 1915) Wingrave states that the spirochaetes of Vincent's disease, when found in the nose, accessory sinuses, decayed teeth, and the middle ear are almost invariably associated with pyogenic organisms. Purulent otitis media, therefore, offers a suitable nidus for the growth of the spirillum, but its specific pathogenic effects are probably masked by those of the more resistant pyogenic organisms, and the typical lesion is thus not more commonly developed.

CLINICAL NOTE.

ARTIFICIAL CEREBRO-SPINAL FLUID.

Two or three years ago I experienced a small run of cases of otitic meningitis which were treated in the usual way by drainage with considerable success. Thinking over the fatal cases, it occurred to me that for purposes of lavage of the cerebro-spinal spaces and cavities an artificial cerebro-spinal fluid ought to have preference over the usual normal saline, as the latter is apparently a fluid foreign to these regions.

Unfortunately—or fortunately—I have not since had an opportunity of trying the fluid, and as some efforts are now being made to treat epidemic meningitis by lavage, it may be well to publish the constitution of the fluid we employed.

The following, then, is the formula; it was prepared for me by Dr. Wyatt Wingrave:

Potassium chloride	3.5
Sodium chloride	1.5
Potassium carbonate	0.2
Glucose	2.0
Distilled water	100.0

This forms a stock solution, from which the fluid for use (sp. gr. 1002) is made up as follows:

Stock solution	10
Sterile distilled water	90

Care must be taken in sterilising, as boiling the salts-glucose solution decomposes the glucose. For that reason, in making the stock solution, the salts should be dissolved in the water and the solution boiled before the glucose is added to it. I know of no method of sterilising the glucose itself.

In any event, it is advisable to have the stock solution freshly made for each case and its dilution effected in the operating theatre.

This fluid does not, of course, contain any of the internal secretions with which modern research is acquainting us, such as those of the pituitary gland, and time and experiment are needed before one can say how much pituitrin, if any, should be added to the solution.

Dan McKenzie.

SOCIETIES' PROCEEDINGS.

PROCEEDINGS OF THE AMERICAN LARYNGOLOGICAL ASSOCIATION.

Held at Washington, D.C., May 9, 10, and 11, 1916.

EMIL MEYER, M.D., Abstract Editor, New York.

(Continued from p. 72.)

Sore Throat Clinically Considered.—**Samuel Johnston** (Baltimore). In the clinical study of "sore throat" we should scan the physiognomy of the patient, mark well any changes in the voice tones, and note the odour of the breath before entering into a more detailed examination of the case.

Among the conditions causing changes of the voice may be mentioned paralysis of the soft palate, defections in the conformation of the palatine arch, swollen tonsils, benign and malignant growth in the nasopharynx, laryngeal inflammations, paralysis, and so forth.

The odour of the breath may call attention to such conditions as uremic poisoning, pulmonary gangrene, ozæna, necrosis of the nasal bones, and so forth. The need of careful inspection of the lips, gums, teeth, tongue, palate, pharynx, naso-pharynx, lingual tonsils, epiglottis and larynx is emphasised.

In examining the naso-pharynx an ulcer, usually of an infectious nature, is found here when least suspected, and in infectious diseases sore throat is by no means uncommon.

The writer's experience has proved that diseases of these regions differ in no way from similar pathologic changes in other parts of the body and should receive the same therapeutic and surgical treatment.

Conservative and mild measures, however, should be the rule and guidance.

Dr. LEWIS A. COFFIN : As we grow older I think we all get to such a position where we feel that perhaps as younger men we interfered too much with the architecture of the upper air passages.

The Diagnosis and Management of Vaso-motor Disturbances of the Upper Air Passages.—J. L. Goodale.—In a large proportion of vasomotor diseases of the upper air passages the disturbances are dependent upon the entrance of a foreign proteid into the system. The method of entrance may be through contact of the proteid in question with the mucous membranes of the respiratory or of the gastro-intestinal tract, by inhalation or ingestion, respectively. Foreign proteids may perhaps also develop in or upon these mucous membranes through autolysis of pathogenic or saprophytic bacteria. The application of the skin test to these conditions is of diagnostic value when employed with a recognition of the phylogenetic relationships of animals and plants as determined by studies in serobiology.

Proteid material for testing should be prepared both from the keratin and sera of domestic animals, from the pollen of the chief causes of hay fever, and from the various articles of food which enter commonly into the diet. Bacterial proteids derived from the various invaders of the respiratory tract should be available, either in solution or in the soluble form.

When the skin reactions to the various classes of proteids have been determined, the management of cases will depend largely upon the relative preponderance of the local reactions in relation to the clinical history. If the cause is found to be seasonal, as in hay-fever, immunising treatment by injection of pollen extracts is likely to prove of service. The sensitisation returns during the following winter, and treatment must probably be repeated annually. If the cause is perennial and is due to inhalation of foreign proteids, it is wiser to avoid the cause rather than to seek to effect a cure by immunisation. If the disturbing proteid enters into the ordinary articles of diet, a tolerance may be gradually established by feeding the substance in progressively increasing doses. Disturbances of bacterial origin have not yet been sufficiently studied to enable the formulation of a definite plan of treatment, but the results of these investigations confirm our present methods of treatment, and emphasise the importance of draining regions which can

retain the products of bacterial activity. Septic foci should be removed. Vaccine therapy is likely in such anaphylactic cases to be more accurately guided than in the ordinary individual.

Dr. JOHN F. BARNHILL: I would just like to ask one question with regard to whether the matter has been brought down to a working basis. For instance, if a patient comes to Dr. Goodale, what plan does he adopt for determining what the sensitisation may be? Has he come to any conclusions?

Dr. ROBERT LEVY: We were very much stimulated by Dr. Goodale's work last year. I should like to ask him two questions. First, what is his mode of procedure when we have a multiplicity of sensitisations? I would like to have that more at length. And secondly, having determined for a certain individual his sensitisations to a number of proteids or inhalations (I have particular reference to inhalations), what method does he proceed with in the treatment of these individuals?

Dr. HANAU W. LOEB: I would like to ask Dr. Goodale to tell us if lactate of calcium and calcium chloride salts have, in his experience, had the effect of reducing the sensitisation.

Dr. J. L. GOODALE: If I had read the whole of my paper, all of these questions would have been answered. Answering the first, as to how we proceed, I think the best plan is this: See whether the symptoms are present throughout the year, or whether they come at a definite time. If seasonal, they are probably due to something in the air; most commonly, of course, pollen. If they may occur at any time during the year, we inquire as to whether they stand in relation to colds or conditions of acute infection of the bronchial tubes. If you see the individual is entirely well throughout the summer and winter, and once in the fall or spring has a severe cold and develops asthma, we can, under those circumstances, rule out cases of foods that he takes into the stomach, and also rule out the question of animals; consequently, it is one of these other products. On the other hand, it may not be fully a seasonal infection in that it may come in November or January, or at whatever time it may be, and in that case I should proceed to investigate with special reference to bacterial proteids, and look for those organisms that we know may invade the mucous membranes of the upper air tract. Now, if the symptoms are throughout the year, without much influence from season or travel, or various modifying circumstances, I should look for asthmatic animals—especially in the case of children—cats and dogs. Children don't know cats or dogs trouble them, but they may have asthma entirely due to that. I have a recent letter from a man whose daughter had been the victim of asthma when four or five years old, who looked like a little old woman. It was really pathetic. I found it was due to nothing but the cat, and we kept the cat away. The little child has now resumed the bloom of youth, and the parents are very greatly gratified.

That is the manner in which you proceed. You bring the season the occurrence, the incidence and mode of development of the symptoms into relation with the patients, and that simplifies it very much indeed. The use of lactate of calcium and the chloride has made no material difference.

Angioma of the Larynx.—Emil Mayer.—This affection is of very rare occurrence, the writer having found only forty recorded cases in the world's literature. He presented the history of a woman, aged fifty-two,

who had a history of previous attacks of laryngitis with hæmoptysis, and who had a tumour in the larynx on the left side, extending from the left false cord and covering the true cord on that side. The diagnosis of cancer of the larynx had been made by laryngologists who had seen her previously. The patient was admitted to Mount Sinai Hospital, and the writer asked to report upon her condition, and remove a portion of the growth for diagnosis, if necessary. Owing to the yielding character of the growth, its bluish tinge, and the history of previous bleeding, the diagnosis was made of angioma of the larynx by Dr. Mayer. Removal of a portion for diagnosis was deemed too dangerous, and external operation was advised. This was subsequently performed by Dr. C. A. Elsberg. The growth was removed, the mucous membrane sutured; and the pathologist reported it to be a hæmangioma. The patient made an uneventful recovery. The writer concludes that angioma of the larynx is a rare disease, occurring mostly in adults, the proportion of males to females being about four to one. It may be mistaken for cancer. Endolaryngeal removal, even of a portion of the growth, for diagnosis is fraught with danger, while laryngofissure is entirely safe and feasible.

DR. HENRY L. SWAIN: If Dr Mayer wants another case simply to bear out what he said about the danger in these cases, I might mention one in which I attempted to remove a growth of this kind. We got hæmorrhage all right. If anything further was needed to substantiate the diagnosis, the microscope did. I have a slide at home showing it to be true angioma of that type. I am interested to hear what Dr. Lynch thinks he could do with such a case by suspension.

DR. ROBERT CLYDE LYNCH: I have never had an opportunity of seeing one of these cases, and have, therefore, had no personal experience with them. I think, however, that if it were possible to get underneath the place, and if the surface was not too broad and the position properly localised, it might be possible to do it under suspension. However, that could be decided at the time the case presented itself. After seeing the illustration of the size and site of this angioma, I would not attempt its removal under suspension.

(To be continued.)

THE AMERICAN LARYNGOLOGICAL, RHINO-LOGICAL, AND OTOLOGICAL SOCIETY.

Meeting at Chicago, June 15 and 16, 1915.

(Continued from p. 135.)

A Report of a Collective Investigation on the Curettement of the Eustachian Tube in Chronic Aural Suppuration.—**Sidney Yankauer.**—The author published in *The Laryngoscope* of July, 1910, a procedure for the cure of chronic otorrhea. In order to ascertain what the experience of other otologists had been with this operation, he wrote to over 6000 otologists in the United States and elsewhere. Among nearly 2000 replies, he found 119 operators who had performed the operation from 1 to 53 times, the total number of cases operated upon being 735.

Inasmuch as the operation is based upon the principle that the closure of the Eustachian tube is essential to the healing of the diseased ear, it naturally follows that in those cases in which organic atresia did not result from the operation, a cure could not be expected, and the statement that the closure of the tube will be followed by a cure can be true only of those cases in which the tube has actually been closed. Both sets of figures are given. Of the 735 cases the tube was successfully closed, after one or more curettings, in 609, or 83 per cent. of the cases. The number of patients reported as cured is 379, or 51.5 per cent. of the total number, or 62 per cent. of the number in which the tube was successfully closed. In other words, more than one half of all cases of chronic suppuration of the middle ear have been cured by closing the Eustachian tube through the intact external auditory meatus and without other surgical treatment.

In the author's experience, confirmed by observations extending over ten years, it might be stated as a dictum that whenever the Eustachian tube is permanently closed by organic atresia, a perforation in the drum membrane will never close, and cannot be made to close. Whenever, therefore, in any case it seems to be possible to restore the continuity of the drum membrane, after the suppuration has subsided, and so restore the ear to a perfectly normal condition, the Eustachian tube must not be closed. In such cases the operation is contra-indicated, as it is also in those cases in which it is intended to perform one of the so-called conservative radical operations, which are also supposed to result in the closure of the drum membrane. Furthermore, the procedure is adapted only for the cure of a chronic suppurative process, and should never be employed in the presence of an acute exacerbation. In like manner, the presence of intracranial complications demands the immediate exposure of the entire diseased area, and to delay such exposure until the results of tubal atresia can be known would be entirely unjustifiable; besides which, in the presence of intracranial complications, even if these have become latent, any operative procedure upon the ear, short of a radical exposure of the entire diseased area, might be dangerous, as is suggested by the single death which has followed this operation. The history of this case is detailed.

Inasmuch as the Eustachian tube, in the class of cases under consideration, has permanently lost its function, its closure is harmless; and, inasmuch as it assumes a perverted or pathological function, its patency is detrimental and its closure has become a therapeutic necessity.

Only 266 cases, or 36 per cent., were closed after the first curetting in this series, while two or more curettings were needed in 244 cases. Hæmorrhage, sufficiently profuse to be designated as severe, was reported in only twenty-six or 3.6 per cent. of the cases. The hearing was reported upon in 564 cases. It was improved in 258, or 46 per cent. of the cases, unimproved in 281 or 50 per cent. of the cases, and in 25 cases, or 4 per cent., it was made worse. Hence the hearing was improved in 90 per cent. of the cured cases. Tinnitus was reported in 365 cases, in which it was lessened in 189, unchanged in 159, and made worse in 17 cases.

His procedure may be carried out under local anaesthesia and in dispensary practice.

This collective investigation justifies the following position: Whatever method is adopted to secure the healing of the diseased middle-ear cavities, whether nature be allowed to effect the healing

unaided, whether the efforts of nature be stimulated by the administration of vaccines, whether nature's work be made easier by the removal of some of the diseased parts by minor surgery, or whether her work be made easiest of all by radically removing all diseased tissue, in any event, in every case re-infection of the diseased area must be prevented by closing the avenue of infection, the Eustachian tube.

The following conclusions may be based upon these figures: (1) That closure of the Eustachian tube is harmless because it does not cause the loss of any function which has not already been permanently destroyed.

(2) That it is a valuable therapeutic agent because by it alone half of the cases are cured and the rest so improved that it enables the radical operation to cure the other half.

(3) That it is imperative, not only because the tube has assumed a perverted or pathological function, but because the only other resource which is open to the patient is a radical operation, in which case the tube must be closed anyway.

(4) That every patient should be given the benefit of this procedure, not only because the chances of cure are sufficiently high, but also because if cured thereby the hearing will not only be preserved, but improved.

(5) That the figures here presented also justify the statement that on account of the difference in the effect upon the hearing, the radical operation should be regarded as unjustifiable in any case where there is useful hearing left, until a thorough trial has been given to the closure of the tube alone through the intact auditory passages.

Dr. FRANCIS P. EMERSON congratulated Dr. Yankauer on having devised an effective instrument for clearing out the Eustachian tube. He was in accord with Dr. Yankauer's views concerning the pathology of the Eustachian tube, and with reference to the importance of stopping the reinfection from the tube. His experience, however, and the statistics which he had gathered from other operators at the Massachusetts Eye and Ear Infirmary, did not conform to the essayist's ideas concerning the permanency of the closure of the tube. In the condition to be dealt with there was a funnel-shaped cavity which was already infected, in which the lining membrane might be absent, and in which necrosis of the bony element might be present. The endothelial elements were of lowered vitality. Healing must take place either through granulation or through cicatrization. If there was healing through granulation there would first be inflammation and reaction. During this stage the tube was closed down. But if statistics were to be of value as to the permanency of the healing of such a tube they must be taken two or three years after the operation. In order to try out this method he and Dr. Mosher had turned over all their cases to one of the assistant surgeons, Dr. Longie, and his results were embodied in a paper read before this Society in Atlantic City, last year. Out of twenty-five cases examined it was found that the tubes were open, with discharge and granulations, in eleven cases: tubes closed, with ear discharging, in one case; tubes open with ears dry, in eight cases; tubes closed, with ear dry, in one case. There were four cases in which cholesteatomata were present. These should not be included. During the last month, in order to follow the matter a step further, the speaker went over the records of the Massachusetts Eye and Ear Infirmary, and of the cases which had been operated upon by different operators and in which no skin grafting had been done, only twelve reported for examination. Of these twelve cases only one tube was closed. This was a case in which Dr. Mosher had intro-

duced into the lumen a piece of cartilage. Over the piece of cartilage there was a thin layer of epithelium.

Dr. JOHN F. FAIRBAIRN, Buffalo, N. Y., had tried the method in four selected cases, shortly after the publication of Dr. Yankauer's paper, and after Dr. Yankauer had demonstrated the method to him. He said selected cases advisedly, because he did not believe the procedure would be effective in the presence of a pathological condition in the attic, antrum, or of the ossicles, but absolutely indicated in tubal suppuration. In three cases he succeeded in getting dry ears; in the fourth he got no result. The only difficulty encountered was the intense reaction which followed the operation. This reaction extended up over the promontory. He had since used Urbantschitsch's modification of the Yankauer instrument and method. This instrument was a rasp-like celluloid bougie. A small-sized catheter was first passed through the extended canal to the aural opening of the tube, and through this the bougie was passed and the walls of the tube denuded. He had used this method successfully in five cases.

Dr. YANKAUER, in closing the discussion, said he had been unsuccessful in obtaining a reply from Dr. Lougie to the circular letter which he had sent out. He was therefore glad that Dr. Emerson had referred to it. It is not correct to judge the operation by comparing cases in which the operation had been successfully performed with those in which it had been performed unsuccessfully. It had been shown by this investigation that in cases in which the tube was not closed after curettement, a larger percentage were improved in regard to the suppuration. It was likely that if none of these cases of Lougie's had been curetted, not so many would have been cured. If all of them had been successfully curetted and the tube closed many more would have been cured.

Referring to Dr. Beck's remarks, he stated that it was necessary to remove the mucous membrane from the isthmus: because at this point there was an osteo-chondral synarthrosis, and at such a place, where cartilage meets bone, any irritation will cause thickening of bone, and hence here a bony atresia might be produced. That temporary closure of the tube could be produced by swelling of the mucous membrane seemed quite possible, and in such cases the tube would reopen.

The instrument of Urbantschitsch, to which Dr. Fairbairn referred, was a roughened celluloid bougie, and was introduced into the tube through the Eustachian catheter, and was not intended to destroy the mucous membrane, but merely to set up an irritative inflammation.

The End-results of the Radical Mastoid Operation.—S. MacCuen Smith.—The author gave a short review of the evolution of the mastoid operation from Riolanus in 1649 to Stacke in 1891. In his practice he had considered the indications for the mastoid operation valid only in those cases that had utterly failed to respond to persistent non-operative treatment, but he believes that the end results are probably much better, especially in point of hearing, when the operation is performed reasonably early.

In a large percentage of these chronic cases the middle fossa is found to be unusually low, the sinus in some instances being so far forward as to occupy the greater part of the antrum; hence the advantage of an X-ray photograph to determine these points, more particularly the position of the sinus.

Dr. SMITH sent letters to 334 patients requiring them to come for an

examination as to the end results of the radical mastoid operation. Two-thirds responded. Suppuration had completely subsided in a large percentage of cases, and in those in which it still continued, its source was the tympanic cavity, being usually due to the Eustachian tube becoming patulous. An examination of some of the cases which showed no discharge showed complete dermatization, an improvement in the hearing, entire absence of all head symptoms, and not the slightest accumulation of desquamated epithelium. The time of examination varied from 2 to 14 years after operation, and the duration of the otorrhœa before operation ranged from about 1 year to 47 years. The time for after-treatment for out-patients in the hospital service averaged 3 months. This period was considerably reduced for the private patients. The author had never seen an intracranial complication develop after a radical operation. The patients, almost without exception, improved in general health. Dr. Smith found frequent intracranial or labyrinthine involvement at the time of operation, unsuspected before, which almost invariably complicated the recurrent type of chronic discharge.

The cases ranged from 1 year to over 50 years in age, the largest percentage being between 20 and 30. If the functional activity of the internal ear remained the same as before operation, the hearing of the average case should be as good after this surgical procedure as before. In 32 per cent. of the operated cases the hearing is definitely better. In 49 per cent. it remained relatively the same; of the remaining 19 per cent., in 11 per cent. the hearing decreased after operation according to actual records; while in 8 per cent. it decreased according to the statement of the patient. The author therefore believed that the operation is not likely to result in an impairment of hearing.

Bell's palsy developed in 3 cases of the author's series before operation, and 8 subsequent thereto. Two improved slightly, and 4 entirely recovered, and 2 approximately so.

The radical operation should be regarded as a major procedure. Nevertheless, it is usually productive of a maximum amount of good, and is therefore wholly justified. If chronic otorrhœa has its origin in the mastoid antrum or lower cells, it can be relieved, as a rule, only by mastoid operation.

Dr. ARTHUR B. DUEL emphasized the fact that in chronic otorrhea requiring radical operation two distinct types of cases, offering two distinct problems, were encountered. In the first class of cases, the life of the patient was in danger because of the surgical condition present; in the second type there was an annoying discharge which repeated efforts had failed to cure. The end-results in these two types of cases were naturally different. The statistics which had been formulated as to the length of time of healing had been confused with regard to these two types. Those who claimed that their radical cases healed in from five to six weeks had operated in a class of cases in which the surgical condition consisted in a mass of granulations, without necrosis in the bone, and an annoying discharge. The cases which necessitated radical operation for the other condition required, in his experience, a longer time for healing: usually from eight to ten weeks, and in many cases, six months to a year. He would never consider a case in which cholesteatoma was present as healed until at least two years had elapsed without recurrence. The patient, in an uncomplicated case, could be considered out of danger as soon as the operation had been performed. In the cholesteatoma cases the patient was in some danger, though infinitely less after operation,

until recovery was complete. For a long time he endeavoured to skin-graft all his cases, but in his experience had found it better to do the skin-grafting in the third week of the operation, that is, after the cavity had been covered over with granulations. He thought it much safer surgery to leave out the primary skin-graft in all cases. In cases in which exposed dura over the middle fossa or sinus was perfectly healthy it might be considered safe to cover immediately with a skin-graft; but who could be certain, in a suppurating wound, that he was not bottling up virulent organisms? In many cases it was necessary to expose large portions of dura which were covered with a mass of suppurating granulations. One could hardly doubt in such cases that there was great danger in covering this immediately with skin-graft, lest the organisms present set up an active inflammation either in the exposed dura over the middle fossa or sinus. Even allowing that antiseptics strong enough to sterilize these areas were used, they would at the same time render the granulations unfit for receiving skin-grafts.

Dr. E. B. Dench, referring to the effect of chronic purulent otitis media upon the general health, cited two cases in which there had been marked improvement in the general health following the radical mastoid operation. One patient had gained nine pounds in two weeks. This chronic aural suppuration produced a low-grade toxæmia, and it was often difficult to determine just what was the matter with the patient thus affected. The patient who gained nine pounds was supposed by the family physician to have malaria. As to the effects of the radical operation on the hearing, he was glad to see that Dr Smith's statistics tallied with those which the speaker had presented at the Otological Congress at Bordeaux. If hearing was very poor, and there were no labyrinthine complications, hearing would be improved after radical operation. If hearing was only moderately impaired, with no labyrinthine involvement, it would remain the same. If hearing was *very* good, the patient should be told that the operation would probably make the hearing worse. He had not been able to decide upon the two types of cases mentioned by Dr. Ducl. he thought every case with chronic middle-ear suppuration in danger. It could not be said that one case was in danger and another not. Until one had cleared out the middle ear and tympanic cavity and mastoid, and could see the sinus and middle cranial fossa, one could not say there was no danger. The primary skin-graft had been successful in his hands. He had never seen a case in which the skin-graft caused trouble unless the sinus or the dura were very badly diseased. He had grafted over these areas repeatedly without trouble. Secondary grafting had not been so successful in his hands. He saw no reason for subjecting a patient to two anæsthesias. Two weeks was the shortest time in which he had had dermatization. This was almost the invariable rule in both private and hospital cases, the tympanic cavity, roof of the tympanum, and entire mastoid cavity being absolutely dermatised and dry in ten days or two weeks. He had seen many patients two years after operation and had found the cavity perfectly dry.

Dr. GEORGE F. KEIPER referred to the fact that life insurance companies refuse to accept persons with chronic otitis media, and for that reason he always advised such patients to submit to radical mastoid operation. He thought this advisable, not only for the preservation of life, but in order to enable the individual to occupy a more satisfactory position in life.

Dr. JOHN W. MURPHY knew of no class of cases that placed more responsibility upon the doctor than cases of chronic otitis media, not only with regard to life, but also as to hearing. He recalled a case in point, that of a young woman, aged thirty, who had a deaf mother and sister, and who, in childhood, had had double otitis media. The left ear had ceased to discharge, but had no membrane except scar tissue. She had applied for treatment for a rather offensive discharge from the right ear. She had no hearing in the left ear, and a chronic condition in the right, with gradually decreasing hearing. He could not promise that the end-results would be better after operation. She consented to the radical mastoid operation. At the end of two weeks the discharge in that ear stopped, but at the end of two days she developed left-sided paralysis. If that had developed on the right side he would have thought the operation had something to do with it. It was a strange coincidence that a patient should have Bell's palsy on the side of the ear not operated upon, two weeks after the operation.

Dr. JAMES E. LOGAN spoke of cases in which, after thorough operation, with the cleaning out of all necrotic tissue, there were still recurrent attacks. In many such cases he had been able to give permanent relief by cleaning out the vault of the pharynx, which may have been the seat of infection, from time to time. He believed in many cases of chronic suppurative otitis the vault of the pharynx was the cause of the trouble.

Dr. FRANK ALLPORT had been in the habit of estimating his cases, with reference to hearing, in accordance with Dr. Dench's formula. In the large majority of cases the radical mastoid operation gave good results so far as hearing was concerned. For the last five years he had used gauze only for the first few days, substituting the gauze packing in a week's time with boracic acid powder, filling the cavity almost completely with the boracic acid powder, and covering this over with a little gauze. Healing took place more quickly under this form of packing than with anything else. He agreed with Dr. Logan with regard to the part played by the pharynx in the clearing up of these cases. The end-results would be better if all paid better attention to the pharynx, particularly to the clearing out of the fossa of Rosenmüller. He did not employ skin-grafting in all his cases. Whether one resorted to grafting or not, Dr. Dench's results with this method were notable. He had formerly employed the Ballance method, and also Dr. Hammond's method, but latterly, when he used a graft at all, he followed Dr. Dench's plan.

Dr. GEORGE F. COTT said one sometimes had the opportunity of making *post-mortem* examinations of cases in which the radical mastoid operation had been performed. He had had 180 radical mastoid operations. One patient had had a discharge for forty years, and she was aged forty-four. He did a radical operation, when he found a hole in the dura $\frac{1}{2}$ of an in. in diameter, through which the probe passed $1\frac{1}{4}$ in. He dropped the probe down easily, slit this open, and did nothing more. The patient did well. At the end of two years she got sick suddenly, and died in two days. *Post-mortem* examination revealed basilar meningitis, with meningococcus infection. In another case, there was acute middle-ear suppuration, with intense pain for a week. He operated, the patient did well for two days, then the temperature, apparently normal, went up to 104° , then down to somewhat below normal. The patient died. The subarachnoid spaces were found, upon *post-mortem* examination, to be entirely filled with blood, in different stages of clotting. In the third case a girl had acute otitis media of six

weeks' duration. At operation the entire mastoid bone was found to be sclerosed. She had had pain in her eyes since she was very young. She apparently recovered from the operation. He saw her at intervals for six months. She died suddenly, having considerable pain at the base of the brain. *Post-mortem* examination revealed a cerebellar abscess as large as the little finger. She had not had a symptom other than the pain. Two abscesses were found on the parietal lobe of each side.

Dr. THOMAS J. HARRIS said that, judging from the discussion, it would seem that the paper had given the impression that there was nothing but the favourable to be said concerning the mastoid operation. It was his own observation, in this country and abroad, that this was not the case, that such were not the results that were being obtained. It was for this reason that Dr. Smith had been invited to discuss this subject. One had only to go into a clinic in any large city to see patients treated week after week for chronic suppuration, to see case after case of facial paralysis going in for dressings. Was it fair to consider this operation from the results of brilliant operators, or should it not be considered from the point of view of the majority of operators? As Dr. Cott had said, there were cases of death. Was death, in these cases, due to the mastoid, or was it coincidental? The mastoid operation was not performed entirely for chronic suppuration; it was performed frequently as the next step in an intracranial operation. He wished that there might at some time be a *referat*, as had been done in Dr. Yankauer's paper, so that the results of those having a small number of cases might be obtained. There was a feeling that the radical mastoid operation was being overdone, that it was done too quickly. Was that the case? After reviewing the statistics, could it be said that the results for the last fifteen years have been good?

Dr. SMITH, in closing the discussion, said when skin-grafting was first introduced, he had used it with not very satisfactory results. He discontinued the method for a number of years, and then, stimulated by Dr. Dench's results, he had taken it up again, but could make no report on the cases so treated, because they were too recent. He employed Dr. Dench's method, using one large graft and two smaller ones, all primary grafts. He had had few cases of Bell's palsy, three of which occurred previous to operation. In two cases he was called out of town on the day appointed for the radical mastoid operation, and that night Bell's palsy developed. If he had operated at the appointed time the palsy naturally would have been attributed to the surgical procedure. Deaths following the radical mastoid operation were, in his opinion, due to complications. He had never seen a death occur in an uncomplicated case.

(To be continued.)

Abstracts.

PHARYNX.

Tonsillitis with Hæmorrhagic Adenitis.—Strange, C. F. "Lancet," October 14, 1916, p. 679.

Soldier, aged twenty-two. Onset sudden, with rigor and severe headache. The following day a large swelling appeared on the right side of the neck. This was opened three days later, and proved to be a large

gland the size of which was entirely due to countless minute hæmorrhages. No pus. The gland was not removed. Operation had a striking effect, temperature going from 103° F. to normal. The wound healed in fourteen days.

Macleod Yearsley.

Clergymen's Sore-throat.—Steele-Perkins. G. "Lancet," October 21, 1916.

The writer, in a letter, calls attention to the fact that parsons who speak *down* to their congregation are prone to this form of pharyngitis and laryngitis, whilst barristers, who speak *up* to the bench, are not. He finds that treatment, by making the patient speak upwards, is indicated and is successful.

Macleod Yearsley.

NOSE.

Perez Bacillus and Ozæna.—Murray, W. R., and Larson, W. P. The "Laryngoscope," November, 1915, p. 763.

The writers give a good account of the known facts in regard to this question and have carried out some original investigations by injecting 27 rabbits with cultures of Perez organism. They were unable to confirm the work of Perez and Hofer, in which these writers state that the Perez bacillus shows a selective affinity for the nasal mucous membrane. The writers never succeeded in isolating the Perez organism from the nose save in those cases in which it was also present in the heart-blood of the animal. In none of the 27 experiments was there any evidence of atrophy of the turbinals. Murray and Larson have also examined 24 ozæna patients, but all gave negative results. Agglutination tests were made from the blood of 34 ozæna patients, but no frank agglutination reaction were recorded. The complement fixation reactions were likewise negative in the 6 cases examined. The writers have further employed vaccines in 12 cases and obtained a local reaction in 6: increased nasal discharge in 3. There was some degree of improvement in 6 cases (50 per cent.), but objective improvement in only 2 cases. The writers come to the conclusion that they have not been able to obtain any experimental evidence that the bacillus described by Perez is the cause of ozæna, and they do not believe that their clinical evidence is sufficient to warrant the belief that the Perez bacillus is the true cause of ozæna as equally good results have been obtained by other investigators who have used other forms of vaccine.

J. S. Fraser.

The Ætiology of Pansinusitis.—Wilson, J. G. The "Laryngoscope," December, 1915, p. 823.

Wilson has experimented on dogs. Both frontal sinuses were opened under aseptic conditions. One sinus was used as control while celloidin capsules containing the following substances were placed in the other sinus: Sterile bouillon, trypan blue, cultures of streptococci, staphylococci, *Bacillus coli*, *Bacillus ozenæ*. Such capsules permit toxins to pass through but prevent the exit of organisms. The dogs were killed at periods of from forty-eight hours to five weeks. The sinuses containing the capsules showed marked reaction in the form of serum, sero-mucous or mucopurulent discharge. Smears from the discharge showed no organisms. The mucosa of the sinus was dark red in colour in early cases, but in

those of longer duration it was pale and œdematous. The control sinuses were normal.

Wilson quotes Schäfer with regard to ciliary movement, which is so rapid that it cannot be seen except when it begins to slacken, due to the cooling of the preparation. The normal ciliated mucous membrane is impervious to organisms, and decrease of the ciliary movement is responsible for the invasion of the sinus by bacteria.

The lymphatic vessels of each sinus converge toward the ostium where they communicate with the main channels in the nose. The larger vessels pass back into the depression between the Eustachian tube and the posterior end of the inferior turbinate. The accessory sinuses are mainly supplied by the sphenopalatine artery and are controlled by a common vaso-motor mechanism.

In ordinary rhinitis we have a local inflammation and congestion of the mucosa of the nose and sinuses. Mucus is discharged into the cavities but the epithelium is still intact. As the inflammation subsides the congestion disappears and the exudate which is not absorbed is removed by ciliary movement. In severe cases, however, the cilia cannot remove the effusion which therefore accumulates. Further, there may be a lymph stasis—the initial step in a lymphatic infection. Bacterial invasion now occurs and the ciliary action is interfered with. The superficial layers of the mucosa may be invaded by micro-organisms.

J. S. Fraser.

Drainage of the Lachrymal Sac and Duct into the Unciform Fossa.—

Mosher, H. P. The "Laryngoscope," November, 1915, p. 739.

In the removal of the anterior ethmoidal cells for ethmoiditis or for gaining access to the naso-frontal duct, Mosher advocates curetting strongly forward until the instrument is stopped by the posterior edge of the ascending process of the superior maxilla. On examining anatomical specimens so operated on, Mosher noticed that in many of them the posterior half of the nasal duct was laid bare. This observation led him to think that the nasal duct could be approached in this way, opened and drained. By this method the duct is reached through soft tissues instead of through hard bone.

Mosher begins with a description of the anatomy of the region involved. He particularly mentions the unciform fossa, which is bounded posteriorly by the posterior edge of the unciform process, anteriorly by the posterior edge of the ascending process of the superior maxilla, superiorly by the inward swelling made by the unciform process, and inferiorly by the upper rim of the inferior turbinate. When stripped of mucous membrane the floor of the fossa is seen to be made by the lachrymal bone below and in front and the unciform process behind. In this region the nasal duct comes to the surface behind the ascending process of the superior maxilla. The posterior inferior corner of the fossa is membranous: this membranous area lies about a centimetre in front of the ostium of the antrum and in a line with it.

Mosher also describes the unciform or lachrymal cells which occupy the space between the upper part of the unciform process and the corresponding portion of the lachrymal bone. The unciform process, owing to its pronounced inward bulge, makes the upper, the posterior, the inferior, and the inner wall of the cell. The outer wall is made by the upper half or two-thirds of the lachrymal bone. The cell extends the whole width of the lachrymal bone and comes into relationship with the upper half of the lachrymal sac. Mosher estimates that the diameter

of the lachrymal sac, when distended, is about 6 or 7 mm., its length about 12 mm. Valves have been described in the duct: the best marked one seems to be at the junction of the sac and duct. The opening of the duct itself into the inferior meatus is of a nature to impede regurgitation.

Mosher's Operation.—The writer prefers general anaesthesia. *First step:* The anterior end of the middle turbinal is removed and as much as possible of the superior overhang taken away. The unciform process should be fully exposed. These procedures may be carried out under cocaine anaesthesia as a preliminary. The lachrymal punctum and canniculus is slit to admit the introduction of Mosher's stiff probe, and this is carried through the duct into the inferior meatus. *Second step:* An incision is made with an angled knife along the posterior edge of the ascending process of the superior maxilla, beginning at the level of the anterior attachment of the middle turbinal. The incision is carried downward and slightly backward parallel to the edge of the ascending process of the superior maxilla and stopping at the upper border of the inferior turbinate. From the bottom of the vertical incision a horizontal cut is now made along the upper rim of the inferior turbinate for about half an inch. From the top of the vertical incision a second horizontal incision is carried backwards across the upper limit of the lachrymal fossa. If this fossa is shallow it is easy to raise the flap which has been outlined. If the fossa is deep, elevation is more difficult. The flap is next tucked backward and downward. *Third step:* This consists in curetting through the inner wall of the lachrymal cell. The instrument is carried outward towards the lachrymal bone into the cavity of the cell and then brought forward against the posterior border of the ascending process of the superior maxilla. *Fourth step:* The stiff probe in the lachrymal duct is slowly withdrawn at the same time making pressure inwards with its point. As soon as the point escapes from the upper rim of the inferior turbinate it breaks through the inner wall of the nasal duct into the unciform fossa. The point of the probe is now advanced a little into the nasal cavity and then swung strongly forward. It thus lays open the inner wall of the nasal duct from the inferior turbinate into the lachrymal sac. *Fifth step:* The probe is re-introduced while the operator curettes along the whole length of the posterior surface of the ascending process of the superior maxilla with a small right-angled curette. This removes spicules of lachrymal bone clinging to the opened inner wall of the duct as well as fragments of the upper part of the unciform process. *Sixth step:* The probe is withdrawn and the bed of the nasal duct widened by biting away the anterior part of the inner wall of the canal, *i. e.* the lip of the ascending process of the superior maxilla. A ligature on a special carrier is now passed from the nose out through the slit punctum. To the nasal end of the ligature a small piece of gauze is attached, kite-tail fashion. The plug should be large enough to hold the flap of mucous membrane firmly in place after it has been smoothed into position. Traction on the ocular end of the ligature draws the plug into place. A small piece of adhesive plaster is used to hold the upper end of the ligature to the skin of the forehead and the lower end to the cheek. *After-treatment:* When the operative reaction has subsided the nasal duct is probed at intervals until the mucous membrane of the unciform fossa has healed in place and the tendency to narrowing has been overcome.

J. S. Fraser.

LARYNX.

The Operation of Laryngo-fissure.—Moore, Irwin. "Lancet," October 14, 1916, p. 675.

A useful article, which clearly describes the technique and stages of this operation. It introduces new instruments designed by the author, which, although they have been for some years in use, are now for the first time introduced definitely to the profession. The paper requires to be read *in extenso*. Macleod Yearsley.

THYROID GLAND.

Some Functions of the Thyroid Gland and their relationship to Goitre.
—Pern, Sydney "Medical Journal of Australia," June 17, 1916.

Goitre is the result of a constant call on the thyroid's activity. Such call in a large number of cases is due to toxins. In thyrotoxic goitres of a mild type and in pronounced Graves' disease a septic focus often exists. Such foci are found in the tonsils, antra, and other nasal sinuses, and at the roots of teeth. Pern has found material benefit follow removal of a septic focus. The thyroid enlargement of pregnancy is due to the call on the gland to destroy toxins. These cases are benefited by thyroid extract.

The next function of the thyroid is vaso-dilatory, in which it is linked up with the sympathetic adrenaline system. Over-action of the adrenals, brought on by fright or shock, has to be met by a correspondingly large large thyroid output.

The third function is that of the metabolism of calcium salts. In Gippsland goitre with mild thyrotoxic symptoms is very prevalent. This is due to the absence of lime in food and water. When treated with calcium salts a large proportion of these goitres vanish.

Goitre is prevalent in limestone hill country, but in this type there are no thyrotoxic symptoms. The thyroid and parathyroids control calcium metabolism, and an excess of this element leads to hypertrophy. If there were more calcium in Gippsland and less in Switzerland and other parts, goitre would be less prevalent. A. J. Brady.

EAR.

Disseminated Myelitis as Complication of an Acute Mastoid Infection.
Hunt, Ramsay. "Annals of Otology, etc.," xxv, 407.

Patient, a woman, aged thirty-five. The organism found at the operation was streptococcus longus. The mastoid operation healed well. Spinal symptoms appeared on the fourth day after operation. She improved slowly during three months, but still showed spastic paraplegia with paresthesias and a girdle sensation when discharged. The complication is unusual. A bibliography is given. Macleod Yearsley.

The Rinne Test.—Sonnenschein, R. "Annals of Otology, etc.," xxv, 455.

It may be said that the duration of air conduction is considerably longer than is ordinarily noted in the usual Rinne test. Whilst this excess is not materially different as between the normal and pathological

cases shown in the author's series, the examination of a large number of cases, particularly those with marked nerve degeneration, may possibly show a different ratio between the air conduction, as shown in the Rinne, and that determined without first placing the fork on the mastoid process.

Maclead Yearsley.

Multiple Abscess of the Brain; Operation; Recovery.—Guttman, John. "Laryngoscope," 1915, p. 284.

Female, aged thirty-three, had acute suppurative otitis media in the left ear. In a few days the drumhead ruptured spontaneously; earache and headache then subsided. Seven weeks after the onset of the trouble, Guttman was called in and found acute mastoiditis with, in addition, headache, nausea, sleeplessness, depression, and fever. Mastoid operation performed: a little pus in the antrum. Thereafter general condition improved for two days, but on the third the temperature suddenly rose to 102° F., pulse 104; severe headache on the diseased side. One attack of vomiting during the next three days. Slight drooping of left upper eyelid and slowness of cerebration. Pulse became slow, 66, and aphasia developed. Second operation: Dura appeared normal, pulsating; director inserted anteriorly and downwards and one ounce of thin, non-fœtid, pus evacuated. Cavity packed with iodoform gauze. Next day patient much better, but amnesic aphasia still continued. Five days later the symptoms suddenly became grave again—headache, slow pulse, and aphasia. The director was now thrust upward and half an ounce of pus was evacuated. No drain inserted. The following day there was a colourless, pulsating liquid escaping from the wound, apparently cerebro-spinal fluid. The patient recovered.

J. S. Fraser.

MISCELLANEOUS.

Headache from the Oto-rhinologist's point of view.—Robertson, W. N. "Medical Journal of Australia," July 15, 1916.

In the nose, pressure by Sheene's spurs, enlarged turbinals, polypi, and foreign bodies is a constant source of headache. The same applies to affections of the sinuses. In dozens of cases the removal of a projecting spine on the septum has completely put a stop to regular headaches. The commonest seat of the spine is well back and low down on the septum. Hypertrophy of posterior ends of inferior turbinals is a cause of headache. The commonest cause is hypertrophy of middle turbinate with pressure on septum. In dealing with hypertrophy of the middle turbinal caused by a large air-cell, Robertson, with a strong, thin pair of nasal forceps, crushes the cell like an egg-shell. This relieves pressure and does not destroy the ciliated epithelium. Adenoids in children cause headaches. The localisation of the pain from different affections is described.

Migraine is not, as a rule, connected with any obvious lesion in the nose, yet the most striking results for its amelioration can be obtained by intranasal treatment. Migraine is a vasomotor neurosis. There is vasodilation in the temporal region, with vaso-constriction over the surface of the body. Cauterisation of the nasal septum in front and beneath the middle turbinal will relieve 75 per cent. of these absolutely. Robertson speaks from experience of 200 cases.

A. J. Brady.

Asthma: Its Cause and Treatment.—Ewbank, W. W. "The Medical Journal of Australia," July 22, 1916.

Spasmodic asthma is a dyspnoea produced by a reflex contraction of the bronchial muscles and a dilatation of the bronchial vessels. The source of irritation is in some portion of the mucous membrane lining the nose.

Defining the reflex arc, Ewbank gives a detailed description of the nerve supply of the nose. Some abnormal nasal condition is always the direct cause of asthma. This is the exciting cause, and behind this there is some predisposing cause which has not yet been determined, but in some cases may be due to a want of balance on the part of some of the endocrinous glands.

Causes and Treatment.—(1) *Chronic hypertrophic rhinitis*: When the inferior turbinal swells and touches the septum, an attack is started. On removing this portion of mucous membrane the attack ceases. Other points of contact develop, and must be dealt with in turn till all excitable areas have been removed. The patient then gets no more asthma. The treatment may take six to nine months. It would be quite easy to remove all redundant tissue at one time, but the less tissue removed compatible with cure the better. (2) *Asthmogenic points*: These are hyperæsthetic nerve-endings. They are roughly the size of a millet-seed. They occur in the region of the middle or inferior turbinated bodies, and may be eight or ten in number on one side. Sometimes they can only be detected during an attack. They must be dissected out. Ewbank condemns the use of the cautery for treating any nasal condition giving rise to asthma. (3) *Septal spurs*. (4) *Deviated septum*, if present, requires to be corrected. (5) *Edematous patches of mucous membrane* on the outer wall of one or both *fossæ*. These patches become swollen and paler than the surrounding tissue. They are about half the size of a threepenny-bit. They pour out a clear fluid. They must be sought for and removed. Two or more of the above causes may be associated in one case. Ewbank says the cautery, as generally applied, does not destroy the asthma spots, or if some nerve endings are destroyed a neuroma forms under the scar. By his method of treatment in 500 cases he claims 82 per cent. cured where the cautery has not been previously applied, where it has the percentage of cures is reduced to 62 per cent. A. J. Brady.

NOTES AND QUERIES.

DR. ALBERT A. GRAY.

Dr. Albert A. Gray has been appointed Lecturer in Diseases of the Ear to the University of Glasgow and Aural Surgeon to the Western Infirmary, Glasgow, in place of the late Dr. Thomas Barr.

ANTERIOR POLIOMYELITIS.

Flexner states that the virus of infantile paralysis is known to leave the infected human body in the secretions of the nose, throat, and intestines. It also escapes from contaminated healthy persons in the secretions of the nose and throat. The virus enters the body, as a rule, by way of the mucous membranes of the nose and throat. Here it multiplies and later penetrates to the brain and spinal cord by way of the lymphatics.—A. O'REILLY, *Interstate Medical Journal*, February, 1917, p. 130.

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WAR INJURIES AND NEUROSES OF OTOTOLOGICAL INTEREST.¹

BY H. J. MARRIAGE, F.R.C.S., CAPT. R.A.M.C.T.,

President Section of Otology, Royal Society of Medicine.

THE following remarks are based upon notes of cases kindly sent to me by Mr. Arthur Cheate, Mr. E. D. D. Davis, Mr. Somerville Hastings, Mr. Pike, and Dr. W. S. Syme, and also on an excellent paper published by Mr. Logan Turner, Mr. J. S. Fraser, and Mr. W. J. Porter, a copy of which was sent to me by Mr. Fraser, in addition to the cases I have seen myself. I propose for the purpose of this discussion on Warfare Injuries and Neuroses to deal with the subject under the following headings:

- I. Injuries of the auricle and external meatus.
- II. Injuries of the middle ear.
- III. Injuries of the internal ear.
 - (a) Direct injury to the labyrinth by a missile.
 - (b) Indirect injury of the labyrinth in fracture of the skull.
 - (c) Concussion deafness.
- IV. Psychological deafness.

I. Injuries of the Auricle and External Meatus.

(a) Wounds of the auricle may be caused by a bullet passing through the ear or by small pieces of metal which either lodge in

¹ Introductory paper of the discussion on the above subject.

the auricle or pass through it; at times the ear is to a large extent torn away. In dealing with these cases all that is usually required is to clean up the wound, remove fragments of metal, and apply antiseptic dressings. If the damage is very extensive it is often possible to save the greater part of the ear by performing a plastic operation, as the blood supply to the auricle is extremely good. The chief complication which is liable to occur is perichondritis with at times necrosis of the cartilage, and should this take place it is generally necessary to dissect out the cartilage before healing will take place.

(b) Wounds of the external meatus are usually caused by missiles which enter either in front or behind the ear and pass right through the meatus; the cartilaginous meatus appears to be most frequently affected, though at times the bony canal may also be damaged. In its course the missile often injures the facial nerve and may also cause more or less injury to the mastoid process. In one case, which I saw about a fortnight after the injury, a bullet entered just in front of the tragus, passed right through the external meatus, struck the tip of the mastoid causing a slight fracture which was seen by X rays, and emerged behind and below the mastoid process. The wound of exit was about the size of a large hazel-nut and gradually filled up without any involvement of the mastoid. There was also some weakness of the lower part of the face, but this recovered. In the meatus there were small perforations in the anterior and posterior walls, which were granulating; these were treated by syringing and plugging the meatus. The drum was not damaged, but there was some internal ear deafness probably due to concussion. The following case of injury to the bony meatus is recorded by Mr. Arthur Cheate: On July 1, 1916, a nearly spent machine-gun bullet accurately entered the right meatus at right angles and without injuring the cartilaginous portion reached the bony meatus, passed through the anterior wall, was deflected downwards and backwards, and emerged behind the upper third of the sterno-mastoid on the same side, lodging in his collar-badge. The man was knocked down, did not lose consciousness, but was dazed, giddy, and sick. When seen a few days later, there was slight thin discharge from the ear, the cartilaginous meatus was normal, but a swelling in the anterior and inferior part of the deep meatus, from which projected a small granulation, obscured the anterior half of the membrane. A longitudinal, healing wound of exit, $1\frac{1}{2}$ in. in length, was present behind the upper third of the sterno-mastoid on the same side. He complained of some deafness

and tinnitus with some difficulty and pain in moving his jaw at the temporo-maxillary joint; no bony crepitus could be heard with the stethoscope on moving the jaw, but there was distinct synovial creaking. He could hear conversational voice at 6 ft., and the tuning-fork on the nose was referred to the injured side.

There was no pain, giddiness, nystagmus, or facial paralysis; the nose, pharynx, and naso-pharynx were normal; the temperature was 99° F. The cartilaginous meatus was painted with iodine and lightly plugged with wool.

After a few days the slight discharge became offensive and facial paralysis came on gradually. The ear was then syringed regularly with saline. In a few weeks the discharge ceased and the facial paralysis gradually recovered. It was then possible to examine the membrane, and it was seen to have been ruptured in the anterior inferior segment. The hearing became almost normal.

The interest of this case lies in the facts:

(1) That a bullet should have so accurately entered the ear and without causing any injury until it reached the deep meatus.

(2) That so little immediate or lasting injury was inflicted.

The bullet must have been a nearly spent one with a falling trajectory.

Cicatricial stenosis of the meatus very commonly results in these cases if there is extensive injury and will cause some deafness, and in addition there may be some internal ear deafness.

Cheatle records the case of an antero-posterior bullet wound of meatus and auricle with (?) labyrinthine hæmorrhage and complete cicatricial closure of the meatus. A lieutenant, while looking through field-glasses, was injured by a rifle bullet which, fired from a range of 200 to 300 yards, passed through the palm of the left hand, glanced off the malar bone, and passed through the meatus cutting the auricle in half. He was unconscious for a few minutes, and was giddy and sick on recovery. He had complete facial paralysis at first, but when examined by Cheatle two months after the injury it had nearly recovered. He said he had been quite deaf since the injury, and that he had been unsteady in walking as if drunk until three weeks before examination. He also noticed that at first things tasted differently, but that had quite passed off. The wounds were healed fourteen days before examination, but with complete closure of the meatus. The deafness in the ear was absolute with Bárány's noise machine in the other and rotation produced no nystagmus. His own voice and

the tuning-fork on the vertex and left mastoid were only heard on the right side.

II. Injuries of Middle Ear.

RUPTURE OF TYMPANIC MEMBRANE.

This has been very common and mainly due to high explosive, and is much more likely to occur when a bomb or shell bursts in a confined space such as a trench or dug-out. It is probably due to increased pressure on the drum; but one must not forget that with reference to windows the glass falls outwards owing to the rarefaction of the air after the explosion, and it is possible that this rarefaction may also have some effect on the drum. The perforation occurs in the membrana tensa, and among the cases submitted to me I have not found any record of injury to the membrana flaccida. From my own cases and from the notes of those sent to me I could not determine that the rupture was liable to occur in any particular quadrant of the drum, but it seems to be most frequent in the lower half. Cheatle in his notes states that it was most frequently in the anterior and inferior quadrant. E. D. D. Davies states that it was always in the lower half. In my own cases there was a slight preponderance of ruptures in the posterior inferior quadrant; and J. S. Fraser, in his article in the *Medical Journal*, states that Japanese otologists have found that in 50 per cent. of cases the rupture is in the posterior part, in 24 per cent. in the anterior part, and in 26 per cent. along the handle of the malleus. In one case which I saw the drum had been torn from its attachment to the lower part of the tympanic ring, and Mr. Pike records a similar case.

The size of the rupture varies enormously from a small pin's head to the loss of half the drum. In cases seen within a few days of the injury the edges are ragged and covered with dried blood, but later the edges become quite smooth.

In a case reported by Mr. Mollison at the last meeting of this Section, owing to an explosion at a munition factory the drum was completely destroyed and the incus blown into the antrum.

The condition of the nose and naso-pharynx, as far as I could determine, had nothing whatever to do with the frequency of the injury, as in the majority of the cases examined by me, both were quite healthy and free from deformity.

The commonest symptoms are marked deafness, with at times loss of consciousness for a few minutes and often slight bleeding

from the ear, which may be followed by a little serous discharge ; rarely there may be tinnitus and slight vertigo due to involvement of the internal ear. As regards the hearing, I found that in most cases, when tested with tuning-fork (C) even a few days after the injury, the bone-conduction was normal, but the air-conduction was diminished, the amount of diminution varying according to the extent of the damage ; in several cases the air-conduction was slightly sub-normal when tested with tuning-fork (C⁵). Complete loss of hearing has not been observed in any of the reports which have come under my observation.

If no suppuration took place, I found healing occurred in one to three months, and E. D. D. Davis gives the time as five to ten weeks.

As regards the frequency with which infection of the middle ear occurred, I am not able to give any satisfactory statistics, but in the cases seen by me, about 30 per cent. had discharge when admitted to the hospital over here. The majority of these healed quite well with good recovery of hearing, and in only one case have I had to open up the mastoid, and that was a patient who had extensive injury of the pinna and external meatus. Cheatle also states that he has only once had to operate on the mastoid, and I have received no notes of any other cases. The usual treatment for ruptured drums adopted over here has been to disinfect the meatus and to keep it plugged with gauze or wool, avoiding all syringing and drops.

Somerville Hastings reports an interesting case of hæmorrhage into the middle ear : On October 6, 1916, a man was wounded on the right cheek by a bomb. When examined on October 24, the handle of the malleus was injected, and behind the membrana tympani dark-coloured blood was seen. The hearing was impaired, Politzer's acoumeter being heard at 2 in., Rinne's test was negative and the bone-conduction normal. On October 30 bubbles were seen in the blood in the right middle ear, and the hearing distance for the acoumeter was 2½ ft. On November 13 all blood from the middle ear had been absorbed, the membrana tympani appeared a little retracted, and the acoumeter was heard at 3 ft.

Cheatle also reports a case of hæmorrhage into the middle ear due to parachute descent. An airman, aged twenty-one years and ten months, fell a distance of 13,000 ft. in four minutes. The only ill-effects of the fall were a feeling of deafness and stuffiness in the left ear, and a crackling when yawning. The left middle ear was found full of blood with an intact membrane. The hearing was

only slightly diminished. Nothing was done in the way of treatment, and in about a month the blood had become absorbed and the hearing had returned.

III. Injuries of the Internal Ear.

(a) DIRECT INJURY OF THE LABYRINTH BY A MISSILE.

These wounds as a rule are fatal, but in a few cases the patient has survived, and Cheattle has reported a particularly interesting one, in which, on July 1, a rifle bullet entered the left temporal region above the zygoma, and emerged just to the left of the second cervical vertebra. He was unconscious for about twelve hours, and was then able to crawl back. When seen over here on July 11 by Dr. Collier, his general condition was good, temperature 100° F. pulse 84. He was quite deaf in the left ear, from which was a copious discharge of cerebro-spinal fluid. He spoke with a husky voice. There was complete paralysis of the left trapezius and sterno-mastoid muscles and of the left side of the soft palate. There was no facial paralysis. Pupils equal and reaching to light. No loss of sensation. The tongue was protruded straight and the diaphragm moved well.

A note on July 14 states he has been running a temperature for some days, maximum 102° F. Some headache. Dull and sleepy. Herpes on lips. July 18, temperature normal; pulse, 64; respiration, 18. General condition good.

Discharge of cerebro-spinal fluid still profuse.

August 1.—All discharge from ear stopped. Getting up.

August 18.—First examined by Mr. Cheattle, who made the following notes:

The deafness of the left ear is absolute. The tuning-fork and his own voice are referred to his right ear. Complete absence of vestibular reaction to cold syringing. No discharge from the ear; the membrane seemed to be replaced by cicatricial tissue and no details could be made out. No Rombergism, no nystagmus. Recurrent laryngeal nerve paralysis of the left cord.

Patient was discharged to a convalescent home with the wounds healed.

(b) INDIRECT INJURY OF THE LABYRINTH IN FRACTURE OF THE SKULL.

These may be caused by falls, blows on the head, or by bullet wounds.

Syme and Fraser state in their paper that "If the force is applied at the side of the head in the direction of the petrous pyramid we get a longitudinal fracture which usually runs along the roof of the middle ear cleft, and, as a rule, in these cases the labyrinth capsule remains intact; if, on the other hand, the force is applied at the back of the head, we get a transverse fracture which runs at right angles to the long axis of the petrous pyramid and always injures the labyrinth. As a rule, these fractures pass through the vestibule. The symptoms of such injuries are extreme or total deafness, marked disturbance of balancing, with loss of the cochlear and vestibular functions. If the labyrinth is injured there is an escape of cerebro-spinal fluid, along with the blood. In the cases in which the labyrinth capsule is not injured, there is no escape of cerebro-spinal fluid; but, nevertheless, deafness results from hæmorrhage into—or tearing of—the eighth nerve. One or two of the cases with fracture of the labyrinth have been microscopically examined many years after the accident, and filling up of the hollow spaces of the labyrinth by new connective tissue and bone has been found, along with secondary degenerative atrophy of the nerve structure."

Cheatle quotes a case of bullet wound causing fracture of the base of the skull with complete labyrinthine deafness on both sides. A bullet entered in front of the right tragus and emerged at a closely corresponding point on the left side. The anterior meatal wall was evidently hit by the bullet on the right side and it just missed the left, for the right ear was discharging and the meatus was filled with granulations. Complete bilateral labyrinthine deafness resulted. Patient had been desperately ill with left hemiplegia and discharge from the nose and wound of exit.

Hæmorrhage from the nasopharynx had necessitated ligature of the right common carotid artery.

X-ray picture appeared to show a piece of metal at the base of the brain, behind the sella turcica, with radiating fracture to vault.

(c) CONCUSSION DEAFNESS.

This may be due to the constant noise of the guns firing day after day, or to the explosion in the immediate neighbourhood of the patient of a shell containing high explosive.

In the former case the results are similar to those seen in peace-time in naval gunnery officers and boilermakers, and in my experience a slight amount of permanent deafness usually persists,

if the patients have been frequently exposed to the noise for long periods.

The deafness due to the explosion of a shell is generally for a short time very severe and at times the patient has been rendered unconscious, but as far as I know the deafness has never been absolute.

As regards symptoms the patient has often only complained of intense deafness with headache, but at other times there has been marked tinnitus in addition, and in the more severe cases there may be nausea and vomiting; it is more common for only one ear to be affected, though both may be, especially if the shell bursts just in front or behind him.

When tested with tuning-fork (C) I have found a positive Rinne with marked diminution of both air and bone conduction, and with tuning-fork (C⁵) also marked diminution of the air conduction.

The drums have been normal.

A large proportion of these patients recover their hearing in the course of one or two months, but others improve very little.

In one case which I saw in 1914 a shell burst just behind a lieutenant without causing him any wound, but rendered him completely unconscious for about an hour, during which time the Germans passed over him and relieved him of anything of value. When he came to he noticed marked deafness of both ears, with intense headache, but had no hæmorrhage from either ear, no discharge, no tinnitus, and no vertigo.

I saw him four days later, when he heard spoken words on each side at a distance of 2 ft., but my watch not at all, though it can usually be heard at 3½ to 4 ft. With tuning-fork (C) air-conduction and bone-conduction were both much subnormal, the air-conduction being better than the bone-conduction, and with tuning-fork (C⁵) the air-conduction was again much subnormal. Both drums were healthy. Throat and nose healthy. No nystagmus. The patient steadily improved and eighteen days after the explosion the hearing on both sides had become normal.

The treatment I have adopted in these cases is complete rest in bed with the administration of bromides in the early stages and later strychnine.

As regards prognosis, I know no means of telling whether the hearing will recover or not, but as far as I can judge from cases I have seen, if marked improvement does not occur within six to eight weeks, the outlook is distinctly bad. Even where the hearing

returns, tinnitus often persists. The exact lesion in these cases I have been unable to determine, as I have not been able to find any record of a *post-mortem* examination, but it is probably chiefly peripheral, as it is rare to find marked concussion deafness associated with a ruptured drum, suggesting that the rupture of the drum lessens the force of the explosion against the internal ear; but it is possible, however, that in some cases at any rate some central injury may also occur, such as hæmorrhages into the pons, medulla, or cerebellum.

I hope some of the members present to-night may be able to clear up this point.

IV. Psychical Deafness.

This is usually bilateral and is commonly seen in those who have suffered a severe shock, *e. g.* by being buried by a shell, without any visible injury being present. The deafness is usually absolute, nothing being heard either by air- or bone-conduction. It is generally accompanied by other nervous signs and symptoms, such as loss of voice, narrowing of the field of vision, tremors, irregular paralyses, and areas of anaesthesia. Spontaneous nystagmus is absent.

Milligan and Westmacott, in their paper read before the Laryngological Section in May, 1915, attribute this to "a temporary suspension of neuron impulses from the higher cortical cells of the central nervous system to the periphery."

They state: "Our view is that the hiatus or synapse interfering with the flow of nervous stimuli is a central and not a peripheral one, for the reason that in so many of the cases of sudden blindness and sudden deafness no trace of any peripheral organic lesion was demonstrable, and, moreover, the rapid recovery of so many of the patients we have observed is a strong argument that none was ever present."

To my mind this is a reasonable explanation, but I shall be glad to hear the views of others, especially of any neurologists who happen to be present. Cheatle has recorded the following two cases: (1) During a bombardment a private suddenly became unconscious without any definite cause and remained so for two days. On recovering consciousness complete bilateral deafness was at once noticed; no giddiness, no bleeding from the ears; had spasms of the neck. No organic lesion was discovered, but the deafness remained and he could not hear the loudest shouting or

his own voice. The vestibular reaction to cold syringing was normal. (2) A Belgian soldier was blown off his bicycle in the retreat from Antwerp and had been completely deaf in both ears, aphonic, and paralysed in his left arm and leg from that time until July, 1916. Rapid recovery occurred on the application of the battery after resistance to many forms of treatment, including hypnosis.

These cases often recover with a counter-shock, with rest and massage, or by giving an anæsthetic, and at times the administration of asafœtida and valerian is useful.

To distinguish this form of deafness from malingering is sometimes difficult, but it can generally be accomplished if a thorough examination is made, as the patient is very liable to give himself away during the performance of the various tests. The malingerer is usually sullen and defiant, has all his wits about him, and replies after deliberation, whereas a patient with psychical deafness has signs and symptoms of nervous breakdown.

Just one word about obturators. I believe they are of distinct benefit in saving the hearing, and that one of the simplest and best forms is plasticine wrapped in gauze; this can be moulded to the shape of the external meatus, and is easily put in and withdrawn. An obturator largely advertised is the Mallock Armstrong, which is made in several sizes, but to my mind it is not so comfortable as plasticine. Plugs made of celluloid should never be used, as I am told that on one ship, during a battle, several men had their ears damaged by the flash of a shell setting fire to the celluloid plugs which they wore.

In conclusion, Gentlemen, I regret that these remarks are very incomplete owing to the comparatively small number of cases which came under my notice, but I hope they will suffice to start a good discussion.

CRANIAL OSTEOMYELITIS FOLLOWING UPON INTRANASAL OPERATION FOR CHRONIC FRONTAL SINUITIS.

By NEIL MACLAY, M.B., C.M.,

Newcastle-on-Tyne; Hon. Surgeon, Throat and Ear Hospital.

CRANIAL osteo-myelitis is a condition which the rhinologist has learned to dread as a possible sequel to the radical operations on the frontal sinus. So far as I know there is no published record of this dire complication associated with the intranasal operative treatment of the frontal sinus.

The intranasal route has been widely adopted and advocated on account of its greater safety as well as its efficiency. I have employed the intranasal method, almost exclusively, for some years, always clearing thoroughly the agger nasi cells and sometimes using the bougie suggested by Dundas Grant, and nothing in any way disquieting has occurred.

Since the publication of the Watson-Williams' technique, and more especially since I had the pleasure of seeing him at work, I have derived the greatest satisfaction from the use of his rasps, and nothing has suggested to me the possibility of an infective osteomyelitis till the subject of this clinical record came under treatment.

The patient, a married woman, aged thirty, had, with the exception of her nasal trouble, a good personal and family history.

Eight years ago she presented herself at the Throat and Ear Hospital Clinic, Newcastle-on-Tyne, complaining of headache, nasal obstruction, anosmia, cacosmia, and dropping of matter into the back of her throat.

Her nose was packed with polypi, and pus could be seen in the epipharynx and pharynx.

The physical examination before and after the removal of the polypi suggested the existence of a purulent pan-sinusitis.

In the course of treatment the maxillary antra were opened *via* the canine fossæ, and cleared of polypi and pus. It was necessary to perform a submucous resection, in spite of the abundant sepsis, as the vertical plate of the ethmoid and part of the septal cartilage deviated so much to the left that the middle meatus could not be approached.

The ethmoidal labyrinth in due course was curetted on each side, and the sphenoidal sinuses opened and drained. The frontal sinuses were approached through the nose after careful estimation of their size by means of the X rays.

The ultimate result of this operative treatment was good. All the subjective symptoms disappeared excepting the anosmia, and the nose became relatively clean.

After an interval of some years the patient came to the Clinic on February 27 of this year. She was seen to be greatly improved in her general condition, and while there was little complaint of headache, she was anxious to be completely rid of the dropping of discharge into the throat, which persisted.

The nose was remarkably clean, and there was no evidence of polypoid degeneration. Pus could not be sucked out of the frontal sinuses by the Watson-Williams' syringe, but a small amount could be blown out when a Higginson attachment was used.

The antra and sphenoidal sinuses were deemed to be all right.

A further intranasal operation was advised, as it was thought that with the use of the rasps we might be able to improve the drainage, and lead to something more approaching a "cure." On February 28, 1917, the operation was carried out under general anæsthesia. There was no difficulty experienced in introducing any of the rasps, and their manipulation was carried out with care and deliberation.

The frontal sinuses were subsequently washed out daily with a good-sized cannula, and all went well, or at least seemed to, for three days.

On the fourth day after operation the patient complained of pain at the root of the nose and inner angle of the left orbit, and there was slight puffiness at the root of the nose. Her temperature was 98° 8' F., and pulse 78. *On the evening of the fourth day* there was swelling at the inner angle of the left orbit and a point of great local tenderness. Temperature was 99° 8' F., and pulse 82.

Next day, March 5, temperature 99° 8' F., pulse 84.

Great complaint of pain. Swelling much more marked, and with a small zone of reddened skin over the point of tenderness at the inner angle of the left orbit.

Deep fluctuation could be made out at this point, and the forehead seemed to be becoming invaded by a pale tumefaction, like oedema.

Under chloroform anaesthesia an incision was made down to the nasal process of the superior maxilla, and about half a teaspoonful of thick pus evacuated. The probe revealed bare bone.

March 6.—Pain unrelieved. The left infra-orbital and malar regions were tumefied, and the left eyelids oedematous.

March 8.—Great complaint of pain over the whole forehead and about the left orbit. The general condition seemed good—tongue clean, and ability to take food unimpaired. Temperature normal in the morning, and 100° F. at night.

March 9.—The incision was enlarged, so as to extend from the left supra-orbital margin to the lower end of the nasal process of the maxilla, and more thick pus was evacuated from below.

March 10.—Pain not relieved. General condition still good. Wound discharging freely.

March 14.—The swelling over the forehead, and particularly in the middle line and at the root of the nose, increased. Swelling and redness appeared at the inner angle of the right orbit.

March 15.—An elliptical incision was made at inner angle of the right orbit and a vertical incision in the middle line of the forehead, and pus evacuated. Bone bare at the bottom of each incision.

March 16.—The pain somewhat relieved, and less sedative required. Temperature not more than 100° F. at night, pulse good and patient able to take food well.

March 18.—Pain as bad as ever. Patient depressed. General anaemia noted. The granulations in the wounds are exuberant and pale. No loose bone felt.

March 19.—Intranasal mucosa oedematous and interfering somewhat with nasal drainage. Report received from Prof. Hutchens on bacteriological examination of pus. No growth.

March 20.—A portion of the granulation tissue was examined and ordinary inflammatory new formation revealed. Wassermann negative.

March 21.—Pain increased and only partially subdued by opiates. Sleep very fitful. Patient depressed and nervous. Anaemia more marked.

March 22.—The whole face oedematous and, apart from the wounds, looked like the oedema of kidney disease. Another specimen of pus revealed no growth.

March 26.—Pain and tenderness particularly severe over the left eyebrow. The left frontal sinus area was exposed freely and the sinus opened *viâ* its anterior wall. There was no visible pus in the sinus, simply oedematous mucous membrane, and the cut surface of the frontal did not look changed.

Small rubber drainage tubes were introduced from external wounds into the nose in order to overcome the intranasal obstruction from oedema, and the tubes were washed through frequently.

Prof. Hutchens reports that the third specimen of pus has grown *Staphylococcus albus* and a streptococcus

March 28.—Patient more comfortable, even cheerful. All the wounds cleaner and the oedema of the face much less. The intranasal oedema so much better that drainage tubes were removed.

March 29.—Temperature down and still showing signs of improvement.

March 30.—Patient drowsy. No severe pain. Expressed herself as being much more comfortable.

March 31.—Drowsiness more marked. Headache increased by movement. Temperature 102° F.; pulse accelerated; reflexes present; pupils equal; no paresis.

April 2.—Coma supervened at mid-day, and death took place at 2 p.m.

Post-mortem.—On removal of the skull cap no pus was found outside the dura; but there was a thick layer of pus under the dura covering the frontal lobes in their entirety and extending into the longitudinal fissure. There was no pus in any of the venous sinuses and no intracerebral pus collection. There was no breach of the inner table of the cranial bones and no lesion of the cribriform plate of the ethmoid. The frontal bone was denuded of its pericranium for the most part and it looked bleached. The frontal sinuses were practically free from gross pus and the mucous membrane was pulpy. The nasal process of the frontal bone, the nasal bones, the nasal processes of the maxillæ, and the lachrymal bones were obviously involved in an inflammatory process of disintegration. The nasal bones were loose and embedded in granulation tissue, and the vertical plate of the ethmoid had become involved. The ethmoidal cell areas were cedematous and contained some pus. There was a little pus in the sphenoidal sinuses, but no evidence of change in the bony walls. There was no sign of active disease in the maxillary antra. Pus from the brain surface yielded the *Staphylococcus albus* and *aureus* and a streptococcus. Specimens of the diseased bone were removed for histological examination and were unfortunately destroyed.

Remarks.—The fact that prior to operation the frontal sinuses contained very little pus shows that the cavities were already draining well, and no doubt the mucosa though infected had established an effective barrier against any spontaneous invasion of the bone of an acute nature. Under these circumstances we may fairly conclude that the operative interference led directly to the development of the bone inflammation.

Route of Infection.—A scrutiny of the recorded cases of osteomyelitis, including those collected by Schilling, Gerbur, and Luc, does not tell us how the infection of the bone was brought about. We presume the route of infection must be either by direct invasion of the bone or through the venous channels: in the present case direct bone infection seems to be the most likely.

The chronic nasal disease doubtless included bone changes of a rarifying type which would produce a condition of friability and consequently greater susceptibility to the dissemination of pyogenic organisms into the deeper bony layers.

A crack, however small, in any of the bones in the narrow confines of the infundibulum, closely associated with the highly

infective mucosa of the ethmoidal cell area, might readily provide the starting point for this septic invasion of the bone.

One is disposed to think that we must suspect the bony structure of the nose itself rather than the frontal bone, as the point of origin of the post-operative osteomyelitis.

CLINICAL NOTE.

ACUTE MIDDLE EAR SUPPURATION, MASTOID EMPYEMA, SINUS THROMBOSIS, PURULENT LEPTOMENINGITIS, CEREBELLAR ABSCESS, OPERATIONS, DEATH.

By W. S. SYME, M.D., F.R.S.E.,

Surgeon, Glasgow Ear, Nose, and Throat Hospital.

On November 2 I was asked by Dr. McLachlan, of Dumbarton, to see with him a boy, aged thirteen, who, following an acute suppuration of the right middle ear of several days' duration, had developed a swelling over and behind the mastoid with high temperature. He had also had a rigor. I went prepared to operate. The patient had an abscess over the mastoid and extending behind and below the mastoid process. On operation there was found destruction of bone over the lateral sinus, but the sinus wall was not evidently diseased and the sinus was not thrombosed. The antrum and cells were opened, and most of the mastoid process was removed. A counter opening was made in the soft parts behind and below.

For a week or more he did well. Then he developed a septic temperature, and he had several rigors.

On November 13 I saw him again. Lumbar puncture gave cerebro-spinal fluid slightly hazy and under moderate pressure. (This was examined by Dr. Haswell Wilson, who reported cocci appearing in pairs and showing chains and a few degenerate leucocytes.) There was no optic neuritis. After tying and dividing the jugular, which was not thrombosed, I exposed the sinus beyond the knee and down to the bulb. The adjacent occipital bone was hyperæmic and very soft, and was removed to a large extent. The radical mastoid was completed. The sinus was then opened, and was found to be healthy except for a small fairly firm clot, which was attached to the deep wall near to the bulb. On removing this clot, clear cerebro-spinal fluid under a good deal of pressure flowed into the sinus. Following these operative procedures the patient was somewhat collapsed, but recovered under treatment, and the next day was comfortable and quite rational. There was no Kernig or Babinski, but the left knee-jerk was more active than the right. November 16: Lumbar puncture again performed. Fluid clear and pressure moderate. November 20: As he had had one or two rigors the upper part of the divided jugular was opened, and foul-smelling purulent fluid was evacuated. The softening of the occipital bone was found to be extending, and so more was removed.

The deep wall of the lateral sinus was bulging and fluctuant. It was incised, and a large cerebellar abscess was opened into, and pus and

softened and broken-down brain-tissue was evacuated. For three or four days the temperature remained about normal, and the patient was conscious and sensible. The knee reflexes on both sides became very active. The temperature then began to rise. Headache was complained of. Lumbar puncture, which had been repeated at intervals, now gave turbid fluid. A counter opening was made in the occipital region into the cerebellar abscess. The patient became delirious, and died on December 3.

The case has several interesting features. The bone condition appears to have been an acute spreading osteomyelitis originating in an acute affection of the tympanum. The sinus became infected probably by way of a communicating vein as the wall contiguous to the bone was quite healthy.

Though there is no doubt that meningitis frequently results from sinus thrombosis this is the first time I have seen cerebro-spinal fluid actually flow into the sinus. No doubt the acuteness of the whole condition accounts for this; adhesions had not had an opportunity to form.

The destruction of the cerebellum was very extensive, and was probably caused by infection from several sources, the sinus and the communicating veins.

In view of the small focus of the disease found in the sinus I did not at that time open the upper part of the divided jugular. I had to do so later.

SOCIETIES' PROCEEDINGS.

ROYAL SOCIETY OF MEDICINE—OTOLOGICAL SECTION.

November 17, 1916.

H. J. MARRIAGE, *President of the Section, in the Chair.*

Chronic Adhesive Otitis: Myringotomy and Partial Ossiculectomy.—**P. Watson-Williams.**—Miss S. E.—, aged twenty-six, came under observation in May, 1916, with deafness of several years' duration. Membrana dry, slightly opaque and thickened, only slight retraction, with dry adhesive catarrhal otitis. Rinne negative. She had been treated in 1914 by another aurist, who repeatedly inflated the middle ear during four months, and ordered a nasal douche for post-nasal catarrh.

When I saw her first she could hear whispered words uttered as loudly as possible (H.W.W.), right 28 in., left 20 in.; after Eustachian catheterisation (H.W.W.) right 54 in., left 36 in.

The maxillary antra and sphenoidal sinuses were explored by my suction syringe method, and muco-pus was found in the left sphenoidal sinus, which was opened on June 14, and at the same time the tonsils were enucleated. Subsequently repeated catheterisation improved the hearing to H.W.W., right 88 in., left 38 in.

On September 20, Gellé test proved positive; I was led to the conclusion that there was absence of stapedio-vestibular ankylosis.

and crucial myringotomy was therefore performed under nitrous oxide gas anæsthesia, with a view to determine how far direct exposure of the oval window to sound waves would improve hearing. Immediately after recovering from the gas anæsthesia the patient's H.W.W. was $7\frac{1}{2}$ ft. (left). Apparently the middle ear was free from discharge, though naturally the bleeding prevented any careful inspection. Subsequently the patient developed a purulent otitis media, although every precaution had been observed with a view to rendering the auditory meatus aseptic. When this had subsided, the patient's H.W.W. was right 6 ft., left 24 ft. On October 17 the left membrana was more freely excised, and the lower half of the handle of the malleus removed, with the intention of making the perforation of the membrana permanent. The beneficial effect of the simple myringotomy has been maintained, and now after further catheterisation of the right Eustachian tube the H.W.W. is right 6 ft., left 24 ft. In other words, the so-called good ear is relatively the deaf ear, and the previously deaf ear has very useful hearing. Whether the improvement, which is remarkable, will be permanent, The patient is submitted in the present stage with a view to as to the desirability of deferring any similar measure to the other ear. It is suggested that the chronic dry adhesive catarrh of the middle ear on both sides was a latent infective process, possibly polynuclears, and probably due to the sinus infection. The drum was incised, it was thought that the traumatism converted the latent into an active inflammatory infection, and it soon responded under appropriate treatment.

It is open to anyone to say that the otitis purulenta and defective precautions having been taken in the way of prior care and in regard to instrumentation; but I took the usual precautions, and I do not think that was the explanation. I think it is the point which has been emphasised by Mr. Fraser—the possibility of a dry adhesive catarrh being a latent infection, which may pass on to a labyrinthine process resulting in otosclerosis. Another point I suggest is the desirability of investigating the condition of the nasal sinuses, especially the sphenoidal, in cases of chronic dry catarrh in the middle ear. In all my mastoid cases I find the condition of the maxillary antrum and sphenoidal sinus, and I think some of our disappointing cases are due to infection of the sinuses.

The PRESIDENT: I should like later on to hear from Dr. Watson-Williams whether this patient's hearing remains good, or whether the present improvement was only temporary. I make this suggestion because I have found so often in the treatment of these chronic dry catarrhs by operation, such as the removal of the drum and skin grafting, etc., that though the hearing improved for a time afterwards sclerosis occurred, and the deafness became as marked as before.

Sir WILLIAM MILLIGAN: Dr. Watson-Williams is to be congratulated—at the moment at any rate—on a very excellent result; but these cases are apt to relapse. Many years ago I tried treatment more or less on the lines he followed in this case, but gave it up because, although improvement took place and lasted a time, I do not think I could name a case in which it persisted for more than a year. Dr. Watson-Williams may still see the re-formation of

membrane. It is true that amputation of a portion of the handle of the malleus militates against this, but, even so, I doubt if there will be permanent improvement. With regard to his explanation as to how the middle ear became infected, I regard it as far-fetched. No one can be quite certain of rendering the external meatus aseptic, and any one may have sepsis after such an operation—though I am sure Dr. Watson-Williams took all ordinary precautions. I do not think his conclusion that the middle ear was the seat of a latent infection is legitimate, because, according to Dr. Watson-Williams's own statement, when he opened the middle ear, it was quite dry. [Dr. WATSON-WILLIAMS: It appeared dry.] At any rate, there was no secretion, and no exudate visible. The patient had had sphenoidal sinusitis on that side, and post-nasal catarrh—perhaps the result of the former—so we have not far to look for the source of infection. There may have been infection of the Eustachian tube, and with manipulation the middle ear became infected. I used to think that part of the want of hearing. The catarrh was due to the lack of lubrication of the vesicular membrane, is, however, a good example of at least the temporary otitis media.

In view of this method of operating for chronic adhesive at that time, the middle ear. Papers recording their experience were so later.

Burnett and Dr. Sexton, of New York, special instruments devised by them, and many ossiculectomies were carried out as a result of their former experiences. I performed the operation on a number of hospital patients, and on a fewer number in private practice, always explaining to each of them that without treatment

ROBERTSON: It was practically no cure, but that this operative method was of great relief. I was allowed to try it on the bad ear, the hope being that it could not make the hearing of that ear worse, and might make it better. For a time, and in a few cases, there was some improvement, but I did not have a single case in which it was permanent. For the last eighteen years I have abstained from operating for this type of deafness. I agree with Sir William Milligan that the probable mode of infection of the ear in this case, but I do so from another point of view.

CATHERINE: I do not think anyone who has been operated on in suppurative lesions of the nasal accessory sinuses can help but be struck by the rarity of suppuration in the ears of these patients, although the chances of infection are so manifold. If you take 100 cases of chronic suppurative otorrhœa, in only about five, if you search long enough, will you find suppurative lesions in them. I have published the only case in which I unwittingly cured a patient's chronic suppurative otorrhœa by operating on his right maxillary antrum. The discharge in his ear had stopped, though it had continued for years. That is one of the few cases in which I remember there was no connection between the two lesions. I do not think the ear should withstand infection in these suppurative cases, unless it is due to auto-immunisation.

sinus, tonsils, and then dropped it. Toynbee gave it up, not only because it gave no great results, but because somebody got meningitis in connection with it.

On infection. Some of the ears in these cases will suppurate whatever precautions you take: one need not go to the extreme for reasons for this. When I first worked at otology

I looked up the subject, and I had a communication from Prof. Politzer. When I saw him, and asked him about it, he said, "I have done it, but it is not a bit of good." Berthold, Schwartz, and Halle described improvements, and again in America the subject was taken up, as has been stated. Eighteen years ago, Dench, of America, published a large number of cases, and I think that in his book it will be seen that he recommends it now. But every one else whose opinion one values considers that the game is not worth the candle. The patients upon whom I have operated in two or three cases of the kind during the last ten years have been doctors' wives; probably their husbands had read up the subject and they were prepared to take the risk. I was very much gratified on one occasion by getting a result similar to that obtained by Dr. Watson-Williams, for directly the patient came from under the influence of the gas she exclaimed that she could hear, and expressed her great delight. This lasted for two days, and the good result was due to the blood having acted as an artificial tympanum. Then I tried glycerine, which seemed to act better, but later there was a relapse. Then the husband asked me to remove part of the drum membrane, with the malleus and the incus, which I did, and we used glycerine and wool as an artificial membrane. But the whole thing went back after a few months, and I think the last stage was worse than the first. There were many adhesions and impaction of the foot-plate of the stapes. In two or three cases the preliminary myringotomy improved the hearing very considerably indeed, but, on the whole, I have had no encouragement to go on with it. One operator, Faulder White, has written on this operation, and, I think, practises it at the present day, but I do not think he has any great following. I shall be glad should we find we can revise our judgment and our conclusions on this special subject, but I fear we shall be doomed to disappointment.

Dr. DUNDAS GRANT: I am afraid we do not know the conditions which lead some perforations to remain open when we want them to close, and others to close when we want them to remain open. As a rule, when a perforation persists, it is because the vitality of the patient, or that of the tympanic structures, is lowered, as happens in tuberculosis, scarlet fever, etc. It is difficult to say whether the fact of suppuration having occurred in Dr. Watson-Williams's case favoured the persistence of the opening, but perhaps that furnishes an indication of means of keeping perforations open. With regard to the reason why the infection should have occurred, if we regard it from the physical standpoint, we see that the mechanical conditions are entirely changed in the tympanic cavity when one opens the tympanic membrane: the pressure is different from what it is when the membrane is whole. Thus, when we force air up through the tube in blowing the nose, we are certain to produce increased compression of air in the tympanic cavity, without solid particles necessarily finding their way up. But when an opening is made in the tympanic membrane, actual material, or at all events microbial contents from the naso-pharynx will be driven up. In the same way the tympanic cavity will often drain much better through the Eustachian tube when a perforation has been made in the membrane, just as when a pipette already full is to be emptied, one has only to remove one's finger from the orifice for the fluid to run out. In this way it is easy for infection to have occurred here, even though Dr. Watson-Williams's asepsis in the meatus may have been perfect. A writer in the *Monatsschrift für Ohrenheilkunde*

professed to keep perforations open by repeatedly injecting liquid vaseline up the Eustachian tube, until it ran out through the perforation. I tried it, and I think it kept a perforation open for some time, but I could not maintain the treatment long enough to judge of its permanency. I congratulate Dr. Watson-Williams on his good result, so far.

Dr. URBAN PRITCHARD: May I go further back in the history of this matter, and remind you that Sir Astley Cooper began this operation for deafness? He happened to perforate a membrane, and got this result. Then it healed up, and, of course, he had done no good. He had so many patients rushing to consult him after that case, that at last he refused to see any deaf patients at all. I am a pessimist as regards this operation. I have seen so many measures tried that I do not think we shall ever arrive at anything like permanent success. This excellent case of Dr. Watson-Williams' is a little spoilt because of the suppuration. If you get suppuration, and thereby permanence, you may get some lasting good. Then there are all the dangers of suppuration. I think that in six months' time this case will be *in statu quo*.

Mr. SYDNEY SCOTT: I would even go a step further than Prof. Urban Pritchard, and warn aspiring performers of this operation that the *ultimate* effect on hearing may be that the hearing becomes worse than it was previous to the operation, in spite of marked temporary improvement. Dr. Watson-Williams has wisely borne this possibility in mind by operating on a patient with *unilateral* deafness. Deplorable consequences were known to have followed this procedure when applied to both sides. I think we should like to know what the condition is, say, this time next year.

Dr. P. WATSON-WILLIAMS (in reply): I wish to thank members for the interest they have shown and the remarks they have made. I feel with them the need for great caution in accepting results until time has shown what the ultimate effect may be. The patient improved before there was any time for suppuration to influence the result: the improvement was so immediate that it could not have been due to suppuration: still, subsequent further improvement might be due to the suppurative process. With regard to Mr. Tilley's point, that he has seen many cases without infection of the ear, I would say that there are good many cases of otitis media, especially the suppurative form, in which, if investigated, we should find the sinuses infected. I have had cases of acute mastoiditis in which cure resulted from operating on the sinuses, the ear being left alone. When the chief trouble is in the ear itself, our attention is not often enough drawn to the sinuses. I agree with Mr. Scott's point, though in this patient it is hardly a moot question as to whether the patient will be worse for the operative procedure than if one had left her alone. I chose the worse ear for operation first, and I told the patient and her parents that I could not guarantee anything at all, and that they must be prepared to take it for what it was worth. In spite of the gratification of the patient, I have refused to operate on the other ear until time has shown that the result in the ear operated upon is completely satisfactory. I shall be glad to bring the result before the Section after the lapse of further time. I have no note of any tinnitus before the operation, and I do not think there is any now.

A Further Case of Otosclerosis associated with Otitis Media.
—J. S. Fraser.—At the meeting of this Section in May I showed a

case of otosclerosis associated with chronic purulent otitis media and cholesteatoma. You may remember that the microscopic examination was rather incomplete, because the region of the oval and round windows had been destroyed by a saw cut. I now wish to demonstrate another case in which I have a complete series of microscopic preparations from both ears.

The patient was a woman who died on January 4, 1916, at the age of sixty-three. She was married in 1881, and her husband tells me that

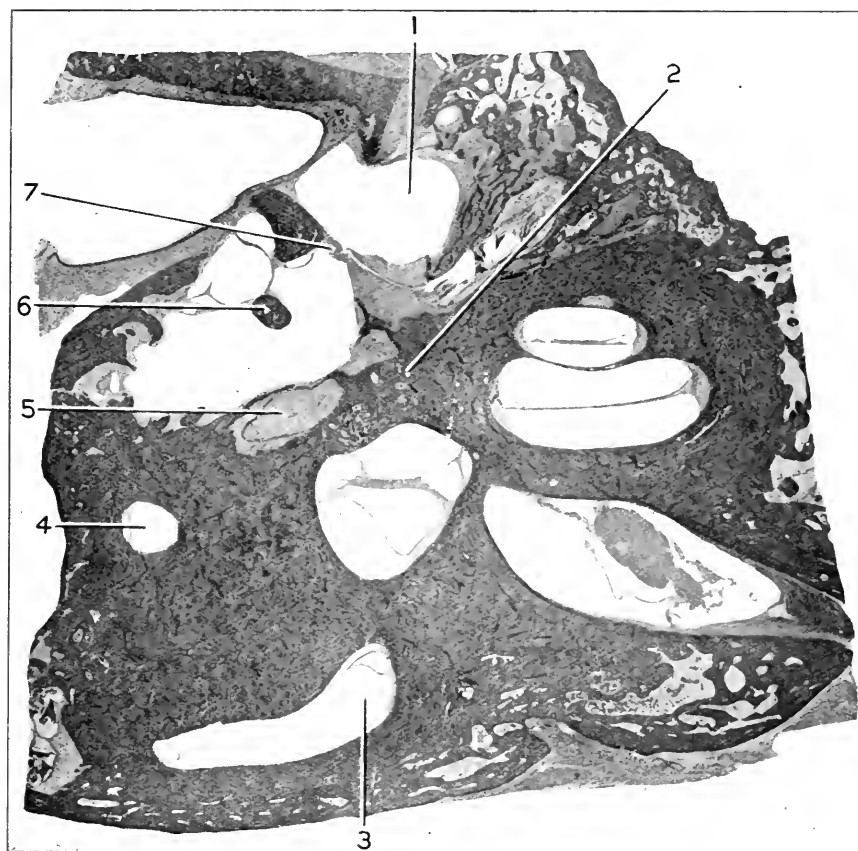


FIG. 1.—Otosclerosis associated with otitis media. A. W.—, female, aged sixty-three. Horizontal section through right ear. No. 180.—1. Anterior or tubal portion of tympanum. 2. Area of otitis vasculosa (otosclerosis) just above level of oval window. 3. Crus commune. 4. Lateral canal. 5. Facial nerve. 6. Incus. 7. Tendon of tensor tympani attached to malleus. ($\times 6$.)

she was very deaf at this time. The patient attributed her deafness to an attack of scarlet fever in childhood. Both she and her brother had scarlet fever and otorrhœa at the same time. Her brother recovered his hearing, but the patients gradually became deaf. Her husband informs me that she always had a purulent discharge from the left ear

and complained of severe tinnitus like the roaring of the sea. The noises also had at times a "beating" character. She sometimes complained of dizziness. As far as her husband knows there was no deafness in the patient's family. I have been unable to obtain definite information with regard to the presence of paracousis, but her husband thinks that she did hear better in a noise. The patient visited the Royal Infirmary about fifteen years ago, and also attended the Eye and Ear Hospital, Cambridge Street, Edinburgh, and had the Eustachian

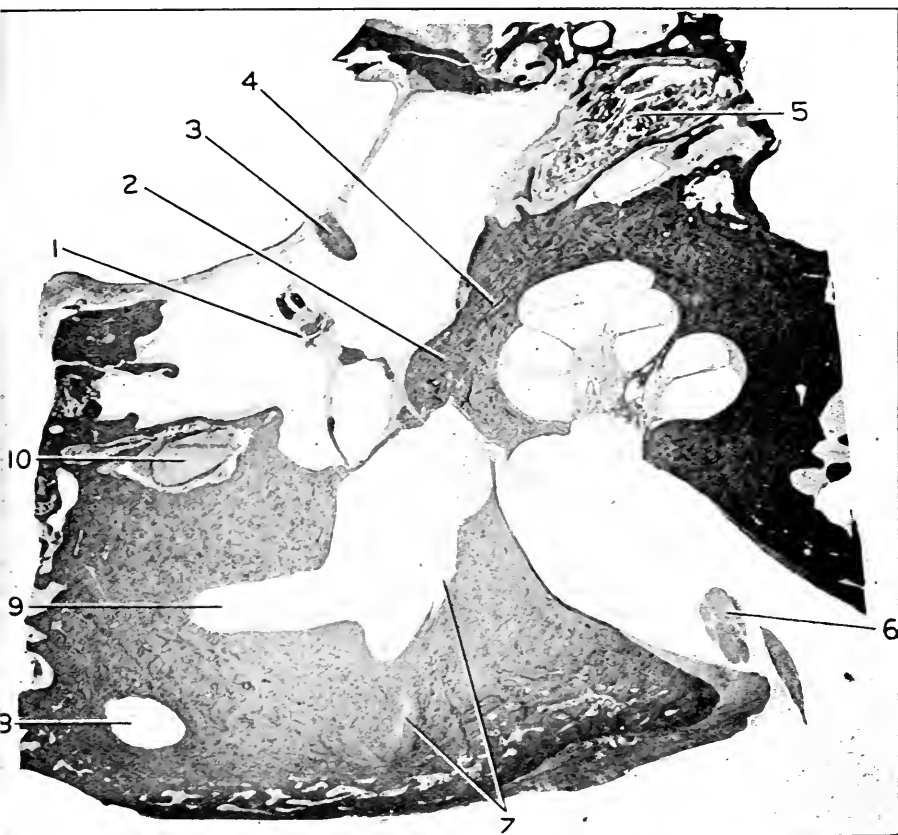


FIG. 2.—Otosclerosis associated with otitis media. A. W.—, female, aged sixty-three. Horizontal section through right ear in region of oval window. No. 250.—1. Joint between incus and stapes. 2. Area of otitis vasculosa in anterior margin of oval window. 3. Handle of malleus. 4. Otitis vasculosa spreads in cochlear capsule between cartilage and lamellar bones. 5. Tensor tympani. 6. Facial nerve: the eighth nerve is absent (artefact). 7. Two parts of endolymphatic duct. 8. Posterior canal. 9. Smooth end of lateral canal joins vestibule. 10. Facial nerve, $\times 6$.)

catheter passed. So far I have not been able to obtain any report regarding the functional examination of the ear. Except for attacks of eczema the patient appears to have enjoyed good health. The husband tells me that the patient had one child before marriage and that after

marriage there was one miscarriage. For three years before her death she was an inmate of the Poorhouse at Craiglockhart, to which she was admitted on March 26, 1913. She suffered from gangrene of the left foot for a short time before death; the temperature was raised for the last fourteen days. *Post-mortem* examination revealed cerebral softening.

Microscopical Examination of Right Ear.

(1) The right external meatus is normal, but the drumhead is slightly thickened in the posterior part—possibly the result of former otitis media.

(2) *Middle Ear.*—The tubal part of the tympanic cavity appears

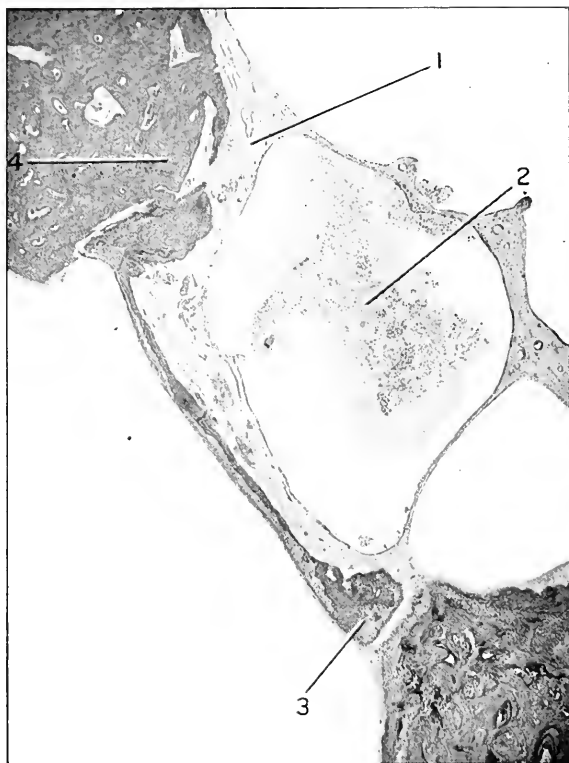


FIG. 3.—Otosclerosis associated with otitis media. A. W.—, female, aged sixty-three. Horizontal section through right ear. No. 220.—1. Thickened mucosa of anterior margin of oval window. 2. Mucopurulent exudate in hollow of stapes. 3. Posterior part of footplate. 4. Region of ankylosis between stapes and oval window. Note the inflammatory process invading the anterior bony margin of the oval window from the deep layer of the swollen mucosa. ($\times 25$.)

to be wide. The mucous membrane of the tympanic cavity appears normal, except in the region of the oval window where the submucosa is thickened, congested, and œdematous. The round window is healthy, and the malleus and incus are normal. The stapes is ankylosed by bone to the anterior margin of the oval window. In the roof of the tympanic cavity the marrow spaces are congested and, where they

lie next to the Eustachian tube, they show leucoblastic reaction or fibrous tissue. The tympanic muscles appear to be healthy.

(3) *Labyrinth Capsule*.—Above the level of the oval window there is an area of osteoporosis or otitis vasculosa. Engorged vessels are seen entering this area from the deep layer of the swollen tympanic mucosa. The otitis vasculosa shows a tendency to extend forward into the cochlear capsule between the cartilage and lamellar bone.

(4) *Labyrinth Contents*.—(a) *Cochlea*: Corti's organ is fairly well formed in the middle and upper coils, but the hair cells are not recognisable. In the lower coil the auditory papilla is not so well formed, but this is not unusual. There appears to be some shrinkage



FIG. 4.—Otosclerosis associated with otitis media. A. W —, female, aged sixty-three. Horizontal section through right ear. No. 265.—1. Area of otitis vasculosa in anterior and lower margin of oval window. 2. Tendon of stapedius attached to head of stapes. 3. Split in bone of posterior margin of window (artefact). ($\times 12$)

of the cells of the spiral ganglion, especially in the basal coil, and slight small cell infiltration of the ganglion, but these changes are too slight and indefinite to have stress laid upon them. (b) *Vestibule*: The otolith membrane of the utricle is separated from the neuro-epithelium, but otherwise the vestibular structures appear to be healthy. The lining membrane of the saccus endo-lymphaticus shows a peculiar appearance—the connective-tissue beneath the epithelium lining being thrown into polypoid folds. (c) *Canals*: The cristæ of the canals are not so prominent as usual, but otherwise there is nothing to note.

(5) *Internal Meatus*.—The eighth nerve has unfortunately been torn out in the removal of the specimen. The seventh nerve appears to be normal.

Summary.

There are slight evidences of an inflammatory change in the marrow spaces in the roof of the Eustachian tube and also in the mucosa lining the niche of the oval window. Elsewhere the middle-ear structures are normal. The stapes is ankylosed to the anterior margin of the oval window, and the bone in this region shows marked osteoporosis which extends forward for a slight distance into the capsule of the cochlea. Considering the age of the patient, the nerve structures of the inner ear may be considered to be practically normal.

(*To be continued.*)

Abstracts.

PHARYNX AND NASO-PHARYNX.

Cartilage and Bone in Tonsils.—Grove, W. E. "Annals of Otology, etc.," xxv, 417.

According to the author, the occurrence of cartilage and bone in the tonsil is not uncommon. It is always near the capsule or in the connective tissue framework and never invades the lymphoid tissue. He is inclined to think that bone found is never true osseous tissue, but due to calcification of pre-existing cartilage. Discussing the origin of these abnormal finds, Grove considers it more logical to explain them as a metaplasia or metamorphosis of connective tissue, due to inflammatory hypertrophic or atrophic regressive changes in the tonsil.

Macleod Yearsley.

The Correlated Action of the Pharynx and Soft Palate, and its Effects upon Post-nasal Diagnosis.—Greenfield Sluder. "Annals of Otology, etc.," xxiv, p. 134.

The effect of "gagging" in distributing the secretions in the nose and naso-pharynx is the object of the thoughtful paper, which requires to be read in the original. The practical application of the author's observations lies in the way in which gagging may deceive the surgeon in his examination.

Macleod Yearsley.

NOSE.

Air and Rhinitis.—Wurtz, W. J. "Annals of Otology, etc.," xxv, 425.

Discusses the influence of hygiene—of body, home, schools, and other public buildings—in the ætiology of "cold in the head." Whilst going into temperature, humidity, *et hoc genus omne*, the author appears completely to ignore the occurrence of infection, and one cannot but admire the complete and skilful way in which he has all mention of bacterial sources of rhinitis.

Macleod Yearsley.

A Contribution to the Bacteriology of the so-called Coccobacillus Fetidus Ozenæ (Perez), with Additional Notes on the Treatment of Clinical Ozena by Means of Polyvalent Vaccines made from the same Organism.—Hoine, H. and Victors, E. A. "Annals of Otology, etc.," xxv, p. 253.

In this paper the authors point out that some characteristics of coccobacillus fetidus ozenæ (Perez) have been erroneously described, in that the organism is motile, may ferment carbohydrates and may produce acid. It is a distinct bacterial entity from Abel's bacillus. There is a startling similarity between it and *B. bronchisepticus* (the specific organism of canine distemper). The coccobacillus fetidus ozenæ group is made up of many subvarieties or strains. The C.F.O. is probably the specific organism of typical fetid ozena in man, and it is suggested that the name of the organism should be changed to "*bacillus rhinosepticus*." The conclusions reached in the authors' preliminary report still stand, with certain exceptions.

Marchal Yearshy.

ŒSOPHAGUS.

Bronchoscopic and Œsophagoscopic Postulates.—Jackson, Chevalier. "Annals of Otology, etc.," xxv, 414.

This short paper cannot be abstracted, but the attention of all who practise bronchoscopy and œsophagoscopy is drawn to it for the admirable and concise advice it contains.

Marchal Yearshy.

EAR.

Tuberculosis of the Middle Ear.—Graham, H. B. "Annals of Otology, etc.," xxv, p. 105.

Details are given of eleven cases, with good micro-photographs. They are useful additions to the already voluminous literature of the disease.

Marchal Yearshy.

An Improved Method for Draining the Tympanic Cavity in Purulent Otitis Media.—Gutman, J. "Annals of Otology, etc.," xv, 389.

This consists in "trephining" the inferior posterior quadrant, irrespective of the bulging part of the membrane, with a special instrument. The method is not really new.

Marchal Yearshy.

The Diagnosis of Otitic Cerebellar Abscess.—Braun, Alfred. "Annals of Otology, etc.," xxv, p. 1.

Gives an analysis of 86 cases, 85 of which were due to ear disease. Discussing symptoms, the author points out that in 10 per cent. of cases death occurs before any signs of intracranial involvement appear, whilst in 14 per cent. they are obscured by other otitic complications. A study of the anatomy and physiology of the cerebellum is very helpful, and the results are carefully discussed, with reference to actual cases, under the headings of: (1) Hypermetria. (2) Cerebellar Asynergy. (3) Adiadokokinesis. (4) Tremor. (5) Disturbances in Writing. (6) Disturbances of Speech. (7) Atony or Hypotony. (8) Cerebellar Catalepsy. (9) Spontaneous Deviation of the Extremities, and Loss of Reaction Movements. (10) Spontaneous Falling and Reaction Movements of the Trunk. (11) Hemiparesis. (12) Fixed Attitude of Head. (12) Vertigo. (13) Underestimation of Weights. (14) Changes in the Reflexes. (15) Headache, Vomiting, Drowsiness, Slow Pulse. (16)

Optic Nerve Changes. (17) Facial Paralysis or Paresis. (18) Temperature. (19) Blood and Cerebro-spinal Fluid Changes. The paper is a valuable and exhaustive one and requires study in its entirety.

Macleod Yearsley.

The Education of the Deaf.—Baldwin, R. N. The "Laryngoscope," 1915, p. 193.

Responsibilities of the Community.—R. N. Baldwin stated that they were establishing an instruction of the deaf which would enable them to compete on more or less equal terms with their neighbours. Some people thought that it was hardly worth while to spend so much money and time in the struggle to bring the abnormal child into nearly normal ways of life, but one such successful case as that of Helen K—— was worth all the time and trouble.

With regard to *medical co-operation*, M. A. Goldstein remarked that for many years a few otologists had endeavoured to stimulate the interests of the medical profession in the cause of the deaf, but so far they had not met with much success. The education of the deaf child was as distinctly an obligation on the community as the training of the normal child. Judging by the statistics obtained from the census, and also from school records, deafness appeared to be increasing in a rather alarming manner. At any rate there was a constantly growing demand for teachers of the aural method.

Practical demonstration with pupils of the Central Institute for the Deaf. Ethel M. Hilliard explained that they based their phonetic work on the system of "visible speech" invented by Alexander Bell. Dumbness was merely the result of deafness. A little hearing child listened for the first year of its life and then began to imitate sounds, words, and final y sentences. With the deaf child who never hears speech the case is very different. The deaf child had the same organs of speech as the normal child, but he did not learn to use them because he did not hear the speech of others, and hence could not imitate it. A means of communication had to be established between the teacher and the deaf child, whereas the hearing child already had speech and language fairly well developed before he came to school. A child's mind developed in the same way whether hearing was present or not, but the difference became marked when the hearing child began to reach out for information by asking questions. For this reason it was most important to give the deaf child a means of communication with the world as early as possible. The instinct for speech developed in the second and third year of the ordinary child's life, and it was much easier to acquire it at this period than later. The deaf child should be talked to all the time. It was surprising what it was possible to do with deaf children of two years of age in the way of teaching them lip-reading and speech. An uneducated deaf child of five or six years did not know the meaning of speech and language. He did not know that objects had names and was puzzled by what he saw other people doing with their lips. Heretofore he had been able to communicate with others only by means of gesture—an inadequate method of expression. Normal people learnt their speech sound by sound as hearing babies, they then combined their sounds and babbled in syllables before they attempted words. The same process had to be followed by the deaf child, except that the deaf child had not the ear to guide it and so had to be taught to imitate the positions of the organ of speech, and for this he had to use his eyes and his sense of touch. In fact the other senses of the deaf child had to take the place of hearing. These other

senses must be thoroughly educated. (Illustrations are given to show how the sense of touch is educated by the handling of various objects while the child is blindfolded, and how rhythm and accent are learnt by musical vibration and also by the child placing her hand on the chest and neck of her teacher. In some respects the teachers of the deaf follow out the Montessori system.) At last a stage is reached at which the child has perceived the vibration in the teacher's throat and is ready by imitation to reproduce the vibrations itself, with his lips, tongue, and palate in a position indicated by the teacher. Thus he acquires his first vowel sound. Consonants and vowels are soon combined into syllables, and then the young pupil begins to make words and sentences. In the meantime lip-reading has been going far ahead of speech. Nouns are learnt first, then verbs. The order of proceeding being lip-reading, speech, writing. In the Barry "five-slate" system the blackboard is divided by vertical lines into five columns. The name of the actor is written in the first (or subject) column, and the verb, which tells what is done, in the second (or predicate) column. The third column is reserved for the object, the person or thing receiving the act; the fourth for the preposition, and the fifth for the object of the preposition. The purpose of the first year's work is to give the child expression for the experiences of everyday life, but the result is largely dependent on the ability of the individual child. In the second year's work the vocabulary is rapidly built up, and new tense forms are given (originally deaf children are always taught the past tense, because when the child is ready to tell what he has done the action is already completed). In the second year, also, there is some branching out into fields of thought outside the knowledge gained through the senses, and the pupil is encouraged to ask questions. The piano is of great use in cultivating the voices of deaf children. The aim is to banish from their speech the deadly monotony which characterises the voices of people who cannot hear their own tones. The piano is also used for giving correct accent. Rhythm, taught by means of vibrations felt through the piano case, and also through the floor, gives the idea of the regular beat in musical measures, and the perception of the accented beat forms the basis for accent in words. The pleasure derived by the deaf child from musical vibration and rhythm is very evident. If a deaf child is asked to pronounce such a word as "capitulate," she at first gives the same value to each syllable, but when she is given the cords on the piano, one of which is accentuated to correspond with the proper accent of the word, she immediately gives the word its correct pronunciation. It is most important to conserve any residual hearing that may be present, and for this purpose elementary sounds are first spoken in clear tones, and later words and sentences are taught. Further on the deaf children study history, geography, arithmetic, just as hearing children do.

Statistics show that about 20 per cent. of all pupils in the public elementary schools have more or less defective hearing. By means of lip-reading, which trains the eye to assist the ear and thus relieves the strain on mind and nerves caused by defective hearing, the task of learning becomes a vastly easier matter.

J. S. Fraser.

MISCELLANEOUS.

Treatment of Hæmorrhage with Normal Blood-serum.—Forbes, H. H. "Annals of Otology, etc.," xxv, p. 145.

In this paper a strong recommendation is made for the use of normal blood-serum in the treatment of non-operative hæmorrhage. The

method is some twenty years old, and its progress is briefly reviewed. According to the author, the evidence collected from the literature and his personal experience of three cases, is predominatingly in favour of electrotherapy.

Macleod Yearsley.

Stock-brainedness, the Causative Factor in the so-called "Crossed Aphasias."—Kennedy, F. (New York).

In the controversy arising from the attack of Marie and Moutier on the classical theory of Broca concerning the positions of the centres governing speech, what appears at first sight to be irrefragable evidence can be produced by both groups of protagonists; by Moutier, for example, the case of Levi, in which Broca's area was destroyed by a neoplasm in a right-handed man without any aphasic symptoms having been produced; and, on the contrary, by the upholders of the classical theory, a large number of carefully observed cases of complete motor aphasia following destruction of the left third frontal convolution in right-handed persons. The strongest evidence at Moutier's disposal consists in certain cases of so-called "crossed aphasia"—combinations of right hemiplegia with aphasia in left-handed individuals, or left-sided palsy with aphasia in right-handed persons. These cases were used by Moutier to disprove the validity of Broca's area as a special speech centre, but in reality they only impugned the theory of constant conjunction in any one subject of right-brainedness and left-handedness, or left-brainedness and right-handedness. It is suggested by the author that the simple statement made by writers on this topic, that a given patient is right-handed or left-handed is not adequate in the light of certain cases which he mentions. Of these there are six, the first three cases were all those of left-handed persons, and in two of them a sudden and severe left-sided hemiplegia was unassociated with any disturbance of speech, while in the third a right-sided hemiplegia was accompanied by aphasia. The second group of three cases were those of right-handed individuals in two of whom left hemiplegia was associated with aphasia, while in the third complete aphasia followed operation on the right Rolandic area for glioma.

The point of special interest on which the author desires to lay stress is that in the first three cases, although the persons were definitely left-handed, in none of them could it be discovered that there was any hereditary tendency to this condition, that is, they came of an exclusively right-handed stock. In the second group of three cases, on the other hand, although the patients were right-handed, there was in each of their families a strong tendency to left-handedness; one of them had both parents left-handed, another, two brothers left-handed, and the third a mother, brother, and daughter all left-handed.

The percentage of cases in which a left-handed trend is present in the stock must be very much larger than can easily be proved by direct statistics. Stier found among 5000 soldiers only 4.6 per cent. left-handed, but in over 60 per cent. of these there was obtained a very definite history of a sinistral tendency in the stock of each individual examined.

It would appear, then, from the cases reported that this trend, when present in the stock, may produce in the few right-handed individuals of the sinistral stock a condition of brain similar to that of their collaterals or ancestors, with the result that the speech area in such persons

becomes developed in an ectopic situation. Likewise a left-handed person occurring eccentrically in a right-handed stock is dominated by the trend of that stock rather than by his own individual peculiarities.

Thomas Guthrie.

The Possible Functions of the Cerebro-spinal Fluid.—Halliburton, W. D

"British Medical Journal," November 4th, 1916, p. 699.

The author first outlines a brief summary of the present state of our knowledge with regard to the cerebro-spinal fluid, and then proceeds to the main object of his address, which is, to discuss the meaning and functions of the fluid. As to the first part of the address, the essential ascertained facts are stated as follows:

(1) The normal fluid contains in solution inorganic salts similar to those in the blood plasma, a trace of coagulable protein, and a certain amount of a reducing substance which has now been definitely proved to be glucose.

(2) The fluid is primarily formed by the secreting cells which are so prominently found covering the choroid plexuses in the cerebral ventricles.

(3) The fluid is normally present at a certain pressure, and this pressure is not the result of arterial pressure passively transmitted to the fluid.

(4) The true cerebro-spinal pressure is the result of the secretory pressure of the choroid epithelium cells.

(5) There are three groups of substances which promote the flow and increase the pressure.

(A) Those agents which produce an excess of CO_2 in the blood.

(B) The volatile anæsthetics, which produce their result:

(i) Possibly by operating in the same way as the A class.

(ii) Or by altering the physical conditions of secretion.

(C) Extract of the choroid gland, or of the brain.

(6) The choroid plexuses are abundantly provided with nerves, but there is no evidence that these are secretory in nature.

(7) The fluid is being continually formed. What becomes of it? The exit is by the blood-stream, and not by the lymph channels of the nerves.

(8) The diffusion process (*i. e.* for substances introduced experimentally into the cerebro-spinal spaces) is most rapid in the subcerebellar district, but is extremely slow in the spinal, especially the lower spinal region.

(9) Dyes added to the fluid travel along the course of certain cranial nerves and this is especially true for the olfactory nerve. This is not the case for the spinal nerves.

The author's own views on the meaning of cerebro-spinal fluid are then given, and his conception of its possible functions may be abstracted as follows:

(1) The mechanical function of support and pressure.

(2) Cerebro-spinal fluid is the only fluid which actually comes into contact with the tissue elements of the brain and cord. It necessarily follows that it must play the part played by lymph in other districts of the body: it must be, for example, the intermediary medium which is traversed by the oxygen on its way from blood to the tissue elements.

(3) We have evidence, supported by the fact that cerebro-spinal

fluid is rich in carbon dioxide, that the products of nerve katabolism pass into the fluid from the tissue elements as they do into ordinary lymph.

(4) The choroid plexus is a definite glandular structure whose function it is to secrete cerebro-spinal fluid. The nutritive materials the fluid contains appear to be formed in the choroid gland, and not to be merely exuded from the blood-stream.

(5) It is difficult to understand why readily diffusible drugs do not escape readily into the cerebro-spinal fluid, as they do into ordinary lymph. The choroidal epithelium must be regarded as a stalwart barrier of cells which keeps back these materials, and only allows its own normal secretion to escape.

(6) Cerebro-spinal fluid is, after all, Locke's modification of Ringer's fluid. As to the real significance of this simple composition, the author takes the following view.

The neurons must be bathed in an ideal physiological saline solution to maintain their osmotic equilibrium. The trace of protein it contains is probably quite sufficient for nutritive purposes. The sugar would serve for a supply of energy. The choroidal epithelium, in order to keep out harmful proteins, keeps back the harmless ones also, almost completely; all share the same process of exclusion. This protective action applies in addition to the majority of soluble drugs.

(7) It is quite possible that the choroidal epithelium may allow the escape of, or even actively excrete carbon dioxide.

(8) The cilia, if they are active, of the cerebro-spinal epithelium, no doubt further the flow of fluid from the cord region to the large veins at the base of the brain, where it so readily bears the subarachnoid space by entering the venous blood-stream.

Archer Ryland.

Salvarsan in the Treatment of Double Infections, Tuberculosis and Syphilis.—Potter, N. B. (New York). "Amer. Journ. Med. Sci.," December, 1916.

Reviewing the literature of the subject, the author draws attention to the remarkable frequency with which an unknown or unacknowledged syphilitic infection exists in patients with tuberculosis. It appears, indeed, that the syphilitic possesses a definitely lowered resistance to tuberculous disease. In many of these cases of double infection striking improvement has followed treatment by means of salvarsan, and the writer believes that it should be promptly employed in latent, chronic, and moderately active tuberculosis: (a) As soon as the nature of an added infection is diagnosed with reasonable probability to be syphilis; (b) whenever the history, signs, or symptoms suggest a previous luetic infection, particularly if such a patient is not improving upon the usually successful hygienic and climatic treatment for tuberculosis; but active tuberculosis, acute tuberculosis, and diffuse miliary tuberculosis are usually contra-indications, although in the first two groups many lentic patients will derive benefit from a small dose of salvarsan. The more active the tuberculosis, the smaller the initial dose, the slower its increase, and the less frequent its administration. Tuberculin-like reactions may follow the injections, and should be carefully watched for, as they may be a useful guide in the selection of the next appropriate dose or interval.

Thomas Guthrie.

CORRESPONDENCE.

To the Editor of THE JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY.

EDINBURGH,

May 17th, 1917.

SIR,—Mr. Macleod Yearsley's paper on "The Causation and Prevention of Educational Deafness" appears to me to be of exceptional interest and importance. The preventive aspect of otology is certainly the aspect of the future, *e.g.* congenital syphilitic affections of the child must be prevented by treating the pregnant mother; medical inspection and treatment of children of school age is not enough, because pathological conditions must be dealt with in infants and "toddlers." Few have anything to say against (1) the operative treatment of nasal and naso-pharyngeal conditions, which set up or maintain infections of the middle-ear cleft, or (2) mastoid exenteration in cases of acute and subacute purulent otitis media which fail to yield in a few weeks to conservative measures. On the other hand, many appear now to doubt the value of the radical mastoid operation, more particularly with regard to the prospect it offers of a complete cure of all discharges. Still, we must admit that full and accurate statistics regarding the percentage of recoveries in sigmoid sinus thrombosis, brain abscess, and meningitis are not so favourable as to tempt us to allow cases of chronic purulent otitis media with cholesteatoma and aural polypus to continue in the hope that "nothing serious may happen." We have all seen too many cases in which operation has been refused or postponed, and in which an intracranial complication has suddenly developed.

The care (?) of ear cases in our fever hospitals is a disgrace to the public authorities concerned. It may be that these authorities would now take some notice of a resolution similar to that passed by the International Congress in 1913, but it is more than possible that they would merely look on it as an attempt by otologists to create for themselves new paid positions at the public expense.

It is good to read that the London County Council takes such a far-sighted view of the education of the deaf, and is willing to spend money in order that children with deficient hearing may grow into useful members of the community. In other areas further legislative powers may be required. A few weeks ago I sent a boy aged sixteen, who had recently become entirely deaf owing to the late form of congenital syphilitic otitis, to the School Board Authorities in Edinburgh. All they could suggest was that the boy should go to the Poorhouse! If we think for a moment of the future of such a case we may realise the difference between the life of a deaf-mute who, having learnt a trade, can take his place in the world and that of the inmate of a Poor-law institution. To put it on the lowest grounds—why should the community lose the value of the work such a boy can do when he grows up? Some authorities are quite pleased to make pets of the deaf as it were—to feed, house, and clothe them—but refuse to invest money in their future by giving them facilities for becoming shoemakers, gardeners, etc.

May I suggest to Mr. Yearsley that the words "educational deafness" are liable to misinterpretation? They might be taken to mean deafness due to education, just as "occupational deafness" is usually taken to mean deafness due to the patient's calling. Would not the words "deafness in children of school age" be less liable to mistake?

When we come to Mr. Yearsley's classification of cases of deafness in children it is not so easy to agree with all he says. The otologist is bound to depend very largely on the history obtained from the child's parents. Anyone who has worked in an hospital knows how unreliable this is, *e. g.* a blow on the ear as the cause of unilateral chronic otorrhœa, when examination shows a large healed perforation in the other ear. Mr. Yearsley admits this point (p. 150—lower third). It is a pity that Mr. Yearsley does not give us a more detailed account of the otoscopic appearances, hearing tests, and of the condition of the vestibular apparatus at least in his "acquired" cases. I fancy that he would find that labyrinthitis is a more common cause of "educational" deafness than is usually supposed. Mr. Yearsley lays great stress on meningitis as a cause of deafness. Does he mean meningitis arising from nasal, nasopharyngeal, or otitic infection *via* the lymphatics, or does he refer to meningitis resulting from bacterial invasion of the blood, or from other causes? His use of "meningitis" reminds me rather of the way in which the word "peritonitis" was employed before we understood much about the appendix or gastric and duodenal ulceration. I am very doubtful about syphilitic meningitis being the cause of congenital syphilitic deafness. The eighth nerve is, no doubt, very vulnerable, but it is said to be less so than the sixth nerve. In cases of meningitis arising from causes other than ear disease one would, therefore, expect the sixth nerve to be paralysed more frequently than the eighth. It would be interesting to hear further from Mr. Yearsley on this point.

The question of the accurate classification of deaf-mutes, and even of "hard of hearing" children is a very difficult one. In many cases it seems to be almost impossible to arrive at anything other than a shrewd guess as to the real cause of the deaf-mutism. The only really accurate method appears to be a *post-mortem* microscopic examination of the ear, and possibly also of the brain! An analysis of all cases hitherto examined, though based on comparatively small numbers, would provide a useful indication of the proportion of congenital to acquired cases, and would clear up to some extent the causation of deafness in the latter class.

J. S. FRASER.

NOTES AND QUERIES.

JEFFERSON MEDICAL COLLEGE, PHILADELPHIA.

Dr. Chevalier Jackson has been selected to fill the Chair of Laryngology made vacant recently by the death of Prof. D. Braden Kyle. We congratulate Dr. Chevalier Jackson, whose work is so well known and appreciated on this side, and we more warmly congratulate Jefferson College on having such wise managers. They were so well aware of Dr. Jackson's world-wide reputation that the Board agreed to consider no other name than his, and he was consequently an unopposed candidate.

SHELL SHOCK.—NEED OF A HOME FOR DEAF SOLDIERS.

The care of soldiers suffering from shell shock was discussed at the annual meeting of the Association in Aid of the Deaf and Dumb in May.

Sir Frederick Milner said a hostel for soldiers suffering from shell shock had just been opened and was full. Every one of the patients in the hostel had been summoned for medical examination under the new Act, and the effect upon their stricken nerves could be imagined. He had asked the War Office to stop this order. He hoped something would be done for deaf soldiers on the lines of what was being done for the blind at St. Dunstan's. Over 1,000 men had been made deaf while fighting, according to Surgeon-General Sir Alfred Keogh, and a large number were hopeless cases. Many wrote to him that they could get no employment. Nothing had been done to meet this difficulty.

THE
JOURNAL OF LARYNGOLOGY,
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THE DEAF SOLDIER.

THE brilliant success which has attended the public-spirited and generous action of Sir C. A. Pearson in providing St. Dunstan's Hostel, an institution where soldiers blinded by the war can be educated to earn their living, has naturally led to the question being raised as to whether a similar training centre cannot be organised for those who have been rendered deaf. As a matter of fact, we are informed, steps have already been taken to carry out this laudable suggestion, and the proposal has received the countenance and support of the Army medical authorities.

Needless to say, we have nothing but praise for the project, and we trust that it will be carried through to completion within a very short time. Steps should be taken, and we hope will be taken, to co-ordinate effort so as to avoid any wasteful overlapping of plans and energies.

It is obvious, even at first sight, that the problem of the deaf soldier presents several characters which are different from those of the blind soldier. To begin with, we are sure to be asked what is meant by a deaf soldier. Deafness, unlike blindness, is seldom absolute. But it may be replied that when the hearing is so poor that ordinary conversation in a loud voice is inaudible then such a person stands in need of special aid, for a defect so serious must handicap him in the struggle for existence.

Again, it is a truism that deafness, even absolute deafness, does not incapacitate the individual sufferer so much as blindness

does. There are many trades and handicrafts, for example, closed to the blind, in which a deaf man would have no difficulty whatever in competing with his normal neighbours. On the other hand, although less crippling to the individual probably in the mass, the damage resulting to the State as a whole from the defect of hearing is quite as serious, since it is probably the case that the number of men rendered deaf by war is greater than the number who are blinded.

Thus one can foresee that institutions formed to combat this new defect of the body politic will have to be numerous and wisely distributed over the country. One of the first tasks to be faced will be, as in the case of blindness, the separation of the functional from the organic defects. Then it will be necessary to provide the deaf with information as to what trades and occupations are suitable to them, and to train them for those callings.

In addition, there ought also to be classes for the teaching of lip-reading, as that accomplishment is, we understand, by no means difficult for a person of average intelligence to acquire.

In England the movement has been started in a letter to the press by Sir Frederick Milner. But, before his letter had appeared, the work had already been set agoing in Edinburgh with very great and encouraging success.

Just as we are going to press we learn that the Government has intimated its intention of dealing with the problem. This is, of course, just as it should be.

CLINICAL RECORDS FROM A PROVINCIAL HOSPITAL.

By NEIL MACLAY, C.M.,

Hon. Surgeon, Throat and Ear Hospital, Newcastle-on-Tyne.

1. **Laryngectomy for Cancer of the Larynx.**
2. **Laryngo-fissure for Intrinsic Cancer of the Larynx.**
3. **Post-cricoidal Cancer of the Gullet.**
4. **Tuberculosis of the Larynx; Tracheotomy; Improvement.**
5. **Epithelioma of the Nose superimposed on a Tubercular Lesion.**
6. **Septic Lateral Sinus Thrombosis.**
7. **Temporo-sphenoidal Abscess.**

1. Laryngectomy for Cancer of the Larynx.

MRS. M——, aged forty-four, was sent to me on January 19, 1916, by Dr. Whyte, of South Shields, on account of hoarseness.

Her personal and family history is good. She is the mother of nine children, the youngest being nine months old.

History of Present Condition.—Intermittent aphonia, then huskiness and hoarseness for a whole year prior to coming under observation by me. There has been no pain, or cough, or difficulty in breathing. Her weight was not thought to be reduced, and there was no complaint of general weakness.

Condition on Examination.—The patient was a short, spare woman with a somewhat anxious expression. The mouth was edentulous save for three septic stumps, and the fauces and nasopharynx were free from any defect.

Examination of the larynx revealed a broad, flat, sessile, new growth with a papillomatous surface and rather pale pink colour, involving the greater part of the right vocal cord. The right cord was practically immobile; there were no palpable glands in the neck.

The condition was thought to be malignant and operation was suggested. The patient was adverse to any kind of operation, but promised to allow a portion of the growth to be removed for microscopical investigation.

Nothing more was seen of her till July 20, 1916, when she returned to me complaining of aphonia and some pain. She now looked thinner and betrayed a little stridor. There were no enlarged glands to be felt in the neck.

Examination of the larynx revealed the fact that the growth was now definitely extrinsic. The true and false cords on the right side were now replaced by a deep rugged ulcer with rounded irregular edge. The right side of the thyroid cartilage was tender to pressure externally.

A portion of the growth was immediately removed, and histological examination showed it to be a squamous epithelioma. After the dental sepsis had been treated and the mouth rendered clean, the trachea was exposed and opened below the thyroid isthmus on September 9, 1916.

At this operation the trachea was isolated and gauze packing introduced in order to promote the growth of granulation tissue and lead to the fixation of the trachea in the neck.

On September 23, 1916, the larynx was removed through the usual incision.

As soon as the larynx was divided from the trachea, the open end of the latter was plugged with a small sponge and the anæsthesia continued through the original tracheotomy opening. The trachea showed no disposition to recede, being firmly fixed by the new-formed fibrous tissue on each side of it.

The larynx was dissected from the anterior wall of pharynx from below upwards, and during this procedure one was guided by a per-nasal india-rubber tube.

The anterior wall of the pharynx was completed above by suturing mucous membrane, fascia, and muscles.

The upper cut end of the trachea was now closed by stout fourteen-day catgut sutures after removal of the sponge plug, which in the meantime had very successfully prevented anything from getting into the windpipe.

The skin-flaps were united by silkworm-gut and ample provision made for drainage at lower end, where gauze was introduced under the flaps and around the tracheal stump. There was very little bleeding during the operation.

The patient was fed through the per-nasal tube as soon as she had recovered from the anaesthesia.

The skin-flaps united for the most part, and in spite of copious discharge of mouth secretion from the lower end of the wound the trachea remained tolerably dry. At the end of the first week the mucous discharge increased in amount, and on opening the upper angle of the skin wound we discovered that the anterior wall of the new-formed pharynx had broken down, exposing the rubber tube for quite $2\frac{1}{2}$ in.

The wound was now drained from above and below, and though the discharge was copious, the amount of pus was small.

A fortnight after operation it was decided not to remove the sutures from upper end of the trachea, but to allow it to become embedded in the granulation tissue, which was now in active formation.

The lower end of the wound gradually became sealed up by granulation tissue, and the additional drainage opening at upper end was allowed to close up. The feeding-tube was retained for five weeks, and at the beginning of the sixth week it was found that the patient could swallow liquids without any leakage from the wound.

The original tracheotomy opening was enlarged in order to accommodate a large-sized cannula for permanent use.

There was no evidence of pulmonary trouble, and, in fact, no untoward constitutional disturbance of any kind.

The patient left the hospital at the end of nine weeks, able to swallow ordinary food, and with her wound soundly healed.

On May 31, 1917, the patient was examined, and found to be in good health, and able to perform her house duties.

The initial closure of the upper end of the trachea and the subsequent obliteration by granulation tissue undoubtedly prevented pulmonary infection during the prolonged escape of the mouth and pharyngeal secretion.

2. Laryngo-fissure for Intrinsic Cancer of the Larynx.

J. W. H——, a clerk, aged fifty-one, consulted me on September 13, 1915, on account of hoarseness of five months' duration. The personal and family histories contain nothing of note.

Condition on Examination.—He was a healthy-looking man, and there was no swelling or palpable gland enlargement in the neck. The mouth was edentulous and clean, and the nasopharynx normal. The epiglottis was of the infantile type and overhanging, but otherwise normal. Examination of the larynx revealed a soft-looking, irregular, pink, fleshy growth involving the anterior third of the left vocal cord. The cord moved freely. An attempt was made to remove a part of the new formation by the indirect method, but the condition of the epiglottis and a highly sensitive patient rendered this procedure impracticable.

On September 16, 1915, with the aid of Hills' slotted tube spatula, a portion of the tumour was removed, and subsequently described by the pathologist as a squamous epithelioma. The operation of laryngo-fissure was performed on September 20, 1915.

A hypodermic injection of morphine and atropine was given half an hour before CHCl_3 anaesthesia.

The trachea was opened above the isthmus, and a small laryngotomy tube introduced between the rings. Five minutes before opening the windpipe about 10 minims of $2\frac{1}{2}$ per cent. cocaine solution was injected into the lumen, and this abolished all reflex coughing. The thyroid cartilage was divided in the middle line with shears and the mucous membrane with a knife.

The wings of the thyroid were gently held apart, and the interior of the larynx carefully inspected with a reflected light. A small captive sponge was now introduced into the upper aperture of the trachea and the soft tissues, including the affected cord, separated from the cartilage from the anterior cut edge back to the vocal process.

The removal of the cord was then completed with scissors, cutting first along the lower limit of separated portion. Bleeding

was controlled by pressure, followed by swabbing with tinct. benz. co.

After removal of captive sponge the thyroid wings were accurately opposed, and the skin and subcutaneous tissues sutured with fishing-gut.

The tracheal cannula was removed in twenty-four hours, and patient was out of bed on the third day. Primary union occurred.

Recent inspection shows that the left vocal cord is replaced by a band of fibrous tissue, which, apart from the colour, is very like a true cord. There is no sign of recurrence, and the patient looks well. The voice is husky.

3. Post-cricoidal Cancer of the Gullet.

Mrs. R—, aged thirty-two, was admitted on April 19, 1917, on account of laryngeal obstruction and inability to swallow solids and liquids.

History of Illness.—Difficulty in swallowing for nine months, which had culminated in complete obstruction six days before admission. The difficulty in breathing commenced on April 16, and was increasing.

Condition on Admission.—Patient looked very ill, and was gasping for breath. Temperature subnormal, pulse 120. There was a hard lump under the right sterno-mastoid and a fulness of the thyroid gland. She was in the seventh month of pregnancy.

Laryngoscopic examination showed a soft cauliflower-like growth in the hypopharynx and bi-lateral abductor paralysis; the cords were being sucked together during inspiration.

The trachea was opened at once under local infiltration anaesthesia, some difficulty being experienced with an enlarged thyroid isthmus. Rectal feeding and stimulation was adopted.

Next day an attempt was made to pass through the stricture Hills' styletted feeding-tube, without success.

With the tube spatula the growth could be seen filling up the post-cricoidal area and extending upwards into the lower pharynx.

Rectal feeding was well tolerated, and patient's condition improved during the next few days.

On April 24, 1917, she gave birth to a fairly well-nourished stillborn child. Two days later, under general anaesthesia, a further attempt was made to use Hills' feeding-tube. On this occasion a small-sized bronchoscopic tube was gently insinuated

through the stricture and the styletted tube passed through its lumen well down into the œsophagus.

On recovery from the anæsthetic, patient was fed through the Hills' tube which was twisted round the ear and retained there by a strip of bandage.

In less than a week she was able to swallow liquids freely alongside the tube. During the last fortnight she has been able to swallow egg, bread, and biscuit, as well as liquids, and the tube though it remains *in situ* is only used for an occasional wash through.

The patient has been up and about for more than a fortnight, and at her own request is allowed to assist the ward-maid.

June 21, 1917. Under chloroform anæsthesia the styletted tube was removed. The rubber was found to be quite soft and friable, and exposed a small part of the metal stylette. A fresh feeding-tube was introduced. The patient is now able to swallow a variety of solid foods with apparent ease.

It is interesting to note that she is not aphonic—the position of the vocal cords permitting a useful degree of phonation.

The case emphasises the value of Hills' styletted tube and its superiority to gastrostomy, at all events in the later stages of malignant stricture of the gullet. The stomach operations have in my experience been most disappointing, and have sometimes made one wish the patient had been left alone.

(To be continued.)

ABSCESS OF THE NASAL SEPTUM OF SIX YEARS' DURATION.

BY JAMES B. HORGAN, M.B., Ch.B.,

Laryngologist to the North Charitable Infirmary, Cork.

THE patient, E. A——, a man, aged twenty-four, consulted me on December 12, 1916, for deafness and nasal obstruction, which he stated were due to nasal polypi.

The history was that he had always been healthy. Six years ago he had had a bad fall from a horse, falling on his face. He has since suffered from nasal obstruction, but did not notice any other serious immediate ill-consequences, was not rendered unconscious, and rode his horse the same day.

Examination revealed a plug of wax in the left ear and a marked and very irregular thickening of the nasal septum anteriorly, which was obstructing both nostrils. This, taken in conjunction with the history and without the use of a probe, I diagnosed to be a fracture dislocation of the anterior part of the cartilaginous septum such as I have frequently seen in cases presenting a similar appearance and history. There was some papillary hypertrophy of the posterior ends of both inferior turbinals.

On December 17 I operated under local anæsthesia with the intention of doing a submucous resection on the nasal septum. I made the customary semilunar incision on the left side. There was an immediate evacuation of about 5ij on thick yellow pus with collapse of the septal thickening. No effort was needed to separate the flaps, which were thickly lined with granulations. Only a very small and attenuated remnant of the cartilaginous septum was found, and that superiorly and anteriorly in the region of the columella, the rest of the cartilaginous and more than half of the bony septum was completely disintegrated, and only visible in the form of several small more or less loose spicules resembling thin pieces of melting ice.

The granulations were curetted away and the left flap slit horizontally near the floor of the nose for a distance of about half an inch. The inner surfaces of the flaps were painted with Whitehead's varnish, and no special drainage adopted. The papillary posterior ends having been snared, the usual gauge plugs were inserted for twenty-four hours. Recovery was uneventful.

The patient has just reported to me by request, six months after operation. He stated that his nasal respiration was now perfect, and that he was no longer troubled with deafness. I noticed some slight depression of the dorsal contour of his nose above the tip, which, however, the patient had not remarked. This was easily remedied by an injection of hard paraffin.

The writer is of opinion that the abscess unquestionably arose from the infection of a septal hæmatoma, which resulted from the injury incurred six years previously, and he is unable to discover in the literature at his disposal any record of a septal abscess having existed for so long a period. The upper teeth and nasal sinuses were all quite healthy, and the fact that the nose had never been sore would exclude the possibility of the abscess being

secondary to furunculosis of the vestibule as in the case described by Dan McKenzie (JOURN. OF LARYNGOL. RHIN. AND OTOL., vol. xxiv, p. 138).

The paucity of the symptoms produced is remarkable, and it would be interesting to ascertain how long spontaneous recovery would have taken and in what manner it would have been achieved. There was no pain or tenderness on examination, and the case is a good illustration of the fallacy of making the diagnosis of nasal disease without the use of the nasal probe. The case is also illustrative of the extent to which the rigid septal partition may be removed in doing a submucons resection of the nasal septum without the risk of significant facial deformity.

SOCIETIES' PROCEEDINGS.

ROYAL SOCIETY OF MEDICINE—OTOLOGICAL SECTION.

November 17, 1916.

H. J. MARRIAGE, *President of the Section, in the Chair.*

A Further Case of Otosclerosis associated with Otitis Media.— J. S. Fraser—(continued).

Microscopic Examination of Left Ear.

(1) *External Meatus*.—The sub-epithelial tissue in the roof of the meatus is swollen and the epithelium itself desquamating. *Drum-head*: The tympanic membrane is very thick in its upper part and is bound to the inner wall of the drum cavity by adhesions. The lower part of the membrane is perforated; at the edges of the perforation the epithelium is absent. There is marked small cell infiltration of the subepithelial tissue at the edges of the perforation. There is no extension of squamous epithelium from the outer surface of the drumhead round the edges of the perforation into the tympanic cavity.

(2) *Middle-ear Cleft*.—(a) *Eustachian tube*: The mucous membrane of the Eustachian tube is swollen and the submucosa infiltrated with small cells. A little pus is present in the tubal part of the tympanic cavity. The epithelium of the tube is clearly desquamated. (b) *Tympanic cavity*: There is great swelling of the mucosa of the attic, the submucosa being converted into granulation tissue. Cystic spaces containing pus are present in the attic and represent the remains of the attic cavity. The walls of these spaces show marked small cell infiltration. In the parts more remote from the attic cavity the bony walls show the usual fatty marrow, while nearer to the attic the marrow is more cellular and next to the submucosa the marrow spaces contain granulation tissue. The bony walls of the attic cavity show marked osteoporosis

and stain deeply with basic stains. The mucous membrane in the niche of the oval window is thickened, congested, and infiltrated. The round window niche shows swelling of the submucosa with some cystic spaces and adhesions but no areas of osteoporosis. Ossicles: The malleus is almost normal. The long process of the incus is plainly eroded and in parts almost resolved into granulation tissue. There is marked ankylosis of the stapes to the anterior margin of the oval



FIG. 5.—Otosclerosis associated with otitis media. A. W —, female, aged sixty-three. Horizontal section through left ear in region of tympanic attic. No. 40.—1. Malleus. 2. Incus. 3. Swollen lining membrane of external auditory meatus. 4. Antrum filled up by swelling of submucous tissue. 5. Two ends of the superior vertical canal. 6. Areas of otitis vasculosa in walls of attic due to inflammatory invasion of the bone from the submucous tissue. ($\times 6$.)

window. The foot-plate itself is greatly thickened. The posterior part of the footplate is not ankylosed, but is jammed tight against the posterior margin of the oval window. Tympanic muscles: The tensor tympani appears to be rather more fatty than usual and the processus cochleariformis is eroded. The stapedius is healthy.

(3) *Labyrinth Capsule*.—There is an area of *ostitis vasculosa* in the bony prominence of the lateral (external) canal as it lies on the inner wall of the auditus. The inflammatory change can be seen to pass in from the congested and swollen mucoperiosteum on the inner wall of the middle ear. There is a second area of *ostitis vasculosa* or *osteoporosis* in the anterior margin of the oval window, where the promontory is much affected. Below the level of the oval window *ostitis vasculosa*



FIG. 6.—Otosclerosis associated with otitis media. A. W.—, female, aged sixty-three. Horizontal section through left ear at eye level of oval window. No. 105.—1. Malleus (eroded). 2. Incus (markedly eroded). 3. Desquamated epithelium in external meatus. 4. Lateral canal. 5. Cystic space in antrum filled with mucoid material. 6. Area of *ostitis vasculosa* just above oval window. 7. Smooth end of superior canal. 8. Capsule of cochlea. 9. Goni-culate ganglion of facial nerve. ($\times 6$)

is still present and bulges inwards, encroaching on the cavity of the vestibule. There is a third area of *ostitis vasculosa* at the apex of the cochlea just below the point where the tendon of the tensor tympani is attached. (It has already been stated that the *processus cochleariformis* showed marked erosion of the bone.) Elsewhere the labyrinth capsule is healthy. The veins of the fossa subarcuata are dilated.

(4) *Labyrinth Contents*.—(a) Cochlea: Corti's organ appears to be well formed in all coils though the hair cells cannot be distinguished. The ganglion cells are very little, if at all, shrunken. The perilymphatic aqueduct is patent at both ends and is normal throughout. (b) Vestibule: The saccule and utricle with the endolymphatic duct are normal. (c) Canals: As on the right side the cristae of all three canals are very low and the cupulae are absent.

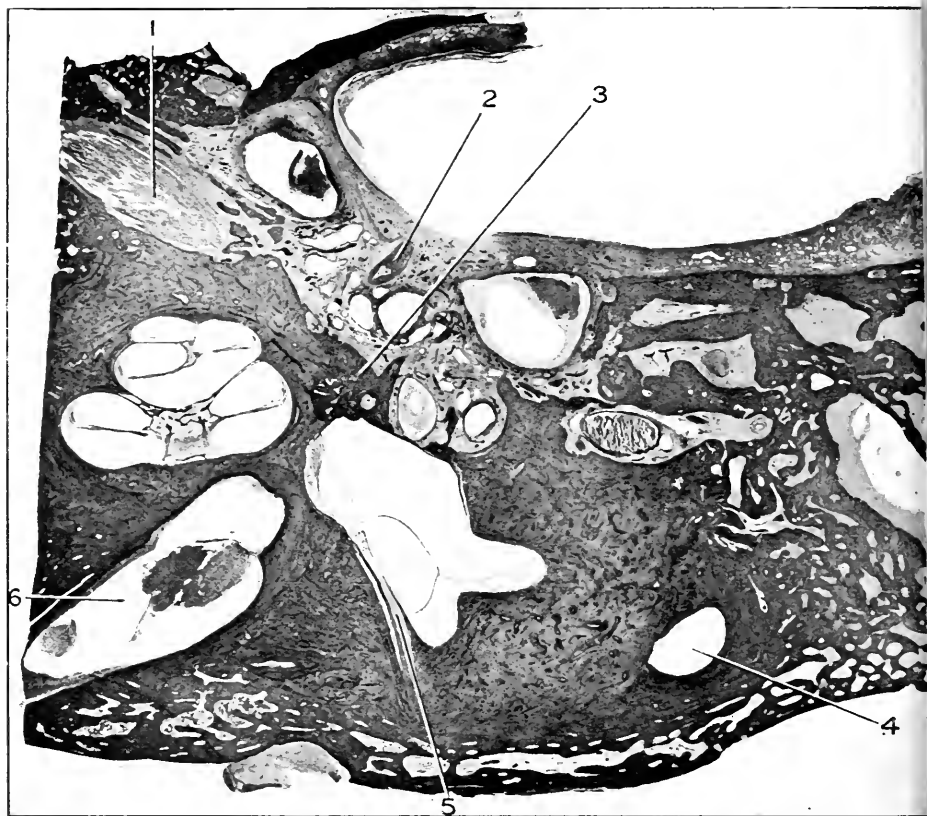


FIG. 7. Otosclerosis associated with otitis media. A. W.—, female, aged sixty-three. Horizontal section through left ear in region of oval window. No. 210.—1. Tensor tympani. 2. Malleus handles. 3. Area of otitis vasculosa (otosclerosis) in anterior margin of oval window, with anterior part of stapes ankylosed to it. 4. Posterior canal. 5. Endolymphatic duct. 6. Internal meatus. Note the marked adhesive process in the tympanic cavity. ($\times 6$.)

(5) *Internal Meatus*.—There are a few small cells in the fundus of the meatus. The vestibular ganglion appears to be healthy, and the two divisions of the eighth nerve are normal. The usual corpora amylacea are present in the eighth nerve at the junction of the central and peripheral parts.

Summary.

On the left side the changes in the middle ear and labyrinth capsule are much more pronounced. Otitis media (purulenta) is still present, and the drumhead is perforated. There is a marked chronic adhesive process in the upper part of the tympanum, with great thickening of the submucosa and erosion of the long process of the incus. The stapes is ankylosed to the anterior margin of the oval window. There

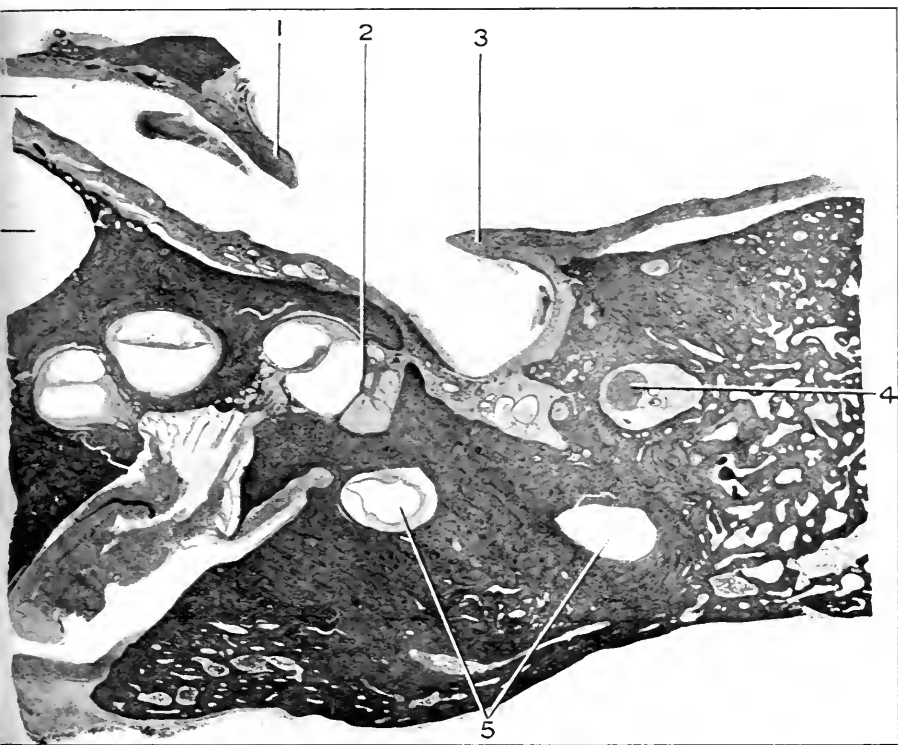


FIG. 8.—Otosclerosis associated with otitis media. A. W —, female, aged sixty-three. Horizontal section through left ear in region of round window. No. 265.—1. Anterior margin of perforation in drumhead. 2. Membrane of round window. 3. Posterior margin of perforation. 4. Facial nerve. 5. Two ends of posterior canal. 6. Carotid canal. 7. Eustachian tube. Note that niche of round window and sinus tympani are both filled up by swollen mucosa. ($\times 6$.)

are three well-marked areas of otitis vasculosa in the labyrinth capsule on the inner wall of the middle ear: (a) in the lateral canal; (b) in the anterior margin of the oval window; (c) at the apex of the cochlea. The labyrinth contents are normal.

I hold that in this case the otosclerosis on both sides was secondary to otitis media. On the right side the otitis media passed off, but left traces in the region of the tube and oval windows. In time the

inflammatory process invaded the bone in the latter area, and resulted in otosclerosis with fixation of the stapes. On the left side the otitis media continued, and invaded the labyrinth capsule in three distinct areas as stated above.

Injuries of the Middle and Inner Ear in Fracture of the Cranial Base.—J. S. Fraser.—At the present time it is hardly within the province of the otologist to enter into the general question of the method of production of fractures of the base. In the—let us hope

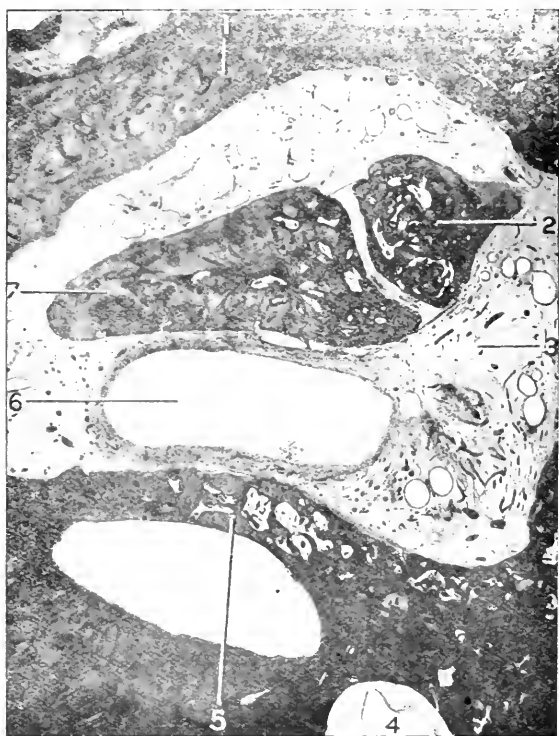


FIG. 9.—Otosclerosis associated with otitis media. A. W.—, female, aged sixty-three. Horizontal section through left ear in region of attic. No. 65. —1. External wall of attic. 2. Malleus. 3. Swollen submucosa. 4. Ampullary end of superior canal. 5. Area of otitis vasculosa in bony wall of lateral canal. 6. Remains of attic cavity. 7. Short process of incus. ($\times 12$.)

near—future, when the otologist has developed into the cranial surgeon, it will be advisable for him to deal with the subject of “bursting” and “bending” fractures, and to indicate the direction of these fractures caused by falls on various parts of the head. At the present time it need only be said that fractures of the cranial base frequently involve the middle and inner ear. Brun¹ finds that there is disturbance of

¹ Brun, H., “Der Schädelverletzte und seine Schicksale,” *Beitr. z. Klin. Chir.* 1903, xxxviii, pp. 192, 289, 601.

hearing in 14 per cent. of skull injuries and in 24 per cent. of basal fractures. The line of fracture may run parallel to the long axis of the petrous bone or at right angles to the long axis.

(1) Longitudinal fractures as a rule start in the orbit or region of the sella turcica, and pass backwards along the line of the middle-ear cleft, breaking the roof of the Eustachian tube and tympanic cavity. The fracture may then pass outwards to the external meatus and squamous region: if this is the case the inner ear is not involved, though the ossicles may be dislocated and the drumhead torn. On the other hand, the fracture, after reaching the roof of the tympanic cavity, may pass inwards through the petrous pyramid, and thus resemble in

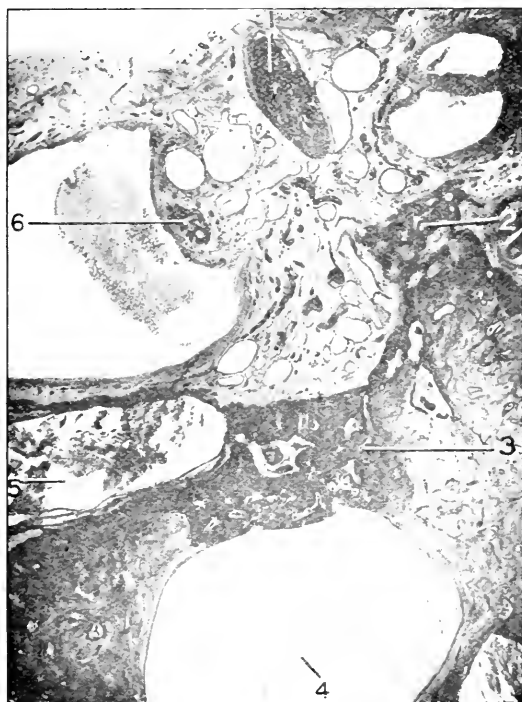


FIG. 10.—Otosclerosis associated with otitis media. A. W.—, female, aged sixty-three. Horizontal section through left ear just above oval window. No. 175.—1. Malleus. 2. Processus cochleariformis. 3. Area of otosclerosis. 4. Utricle, 5. Facial nerve in shreds (artefact). 6. Eroded long process of incus. ($\times 12$.)

some respects those fractures which run at right angles to the long axis of the petrous bone. The inner ear is of course involved in these latter cases. (Case 2 belongs to this second type.)

(2) Genuine transverse fractures of the petrous pyramid run at right angles to the long axis of the pyramid, and always injure the labyrinth. As a rule the fracture passes through the external meatus, roof of the tympanic cavity, vestibule, and internal auditory meatus, as

this is the line of least resistance. The fracture may, however, pass further forward through the cochlea, or further back when the canals are involved.

If the patient survives the injury at the time, he is not out of danger, as meningitis may supervene as the result of infection from the middle-ear spaces, or of contamination of the blood in the external meatus and tympanic cavity. Such a complication is, of course, more likely if the labyrinth is involved in the fracture.



FIG. 11.—Otosclerosis associated with otitis media. A. W—, female, aged sixty-three. Horizontal section through left oval window. No. 205.—1. Long process of incus, showing otitis vasculosa. 2. Malleus. 3. Area of otitis vasculosa in promontory ankylosed to 5, footplate of stapes. 4. Cochlea. 6. Tympanic cavity. ($\times 12$.)

Stenger¹ has experimented on rats, in which he produced labyrinthine concussion by blows on the head. After the injury the rats seemed stunned and lifeless, but soon recovered. The animals were killed at various periods after the injury. In slight cases microscopical examination of the inner ear showed hæmorrhage confined to the region of the round window and lower coil of the cochlea. After more severe injury the whole of the cochlea showed blood extravasation and also hæmorrhages in the cochlear nerve.

¹ Stenger, *Archiv f. Ohrenheilk.*, lxxix.

From the point of view of microscopical anatomy, Nager¹ divides cases of labyrinth injury observed in the human subject, as the result of fracture of the base, into (1) recent and (2) old.

(1) The former cases are those in which the patient dies soon after the injury. In these Barnick² has shown that where the labyrinth capsule is injured, we have marked destruction of, and hæmorrhage into, the inner ear. Even in those cases in which the labyrinth capsule is not injured, we meet with hæmorrhage in the inner ear and eighth



FIG. 12.—Otosclerosis associated with otitis media. A. W——, female, aged sixty-three. Horizontal section through left cochlea. No. 245.—1. Area of otitis vasculosa at apex of cochlea in region of processus cochleariformis. 2. Tensor tympani. 3. Area of otosclerosis below oval window. ($\times 10$.)

nerve. The auditory nerve may be ruptured (Lange³ and Link⁴), and the crura of the stapes torn from the footplate.

(2) With regard to the old cases, it appears that up to 1909, at any rate—the date of publication of Nager's paper—only two cases had

¹ Nager, *Med. Klin.*, 1909, No. 40.

² Barnick, *Archiv. f. Ohrenheilk.*, xliii.

³ Lange, *Zeitschr. f. Ohrenheilk.*, liii.

Link, *Zeitschr. f. Ohrenheilk.*, lvii.

been microscopically examined: (a) Manasse's¹ patient had suffered from fracture of the skull fifteen years before death, and yet on microscopic examination the line of fracture was still clearly visible—partly closed by fibrous tissue and partly by new bone. The break traversed the stapes and vestibule as in Case 2 recorded below. Manasse found

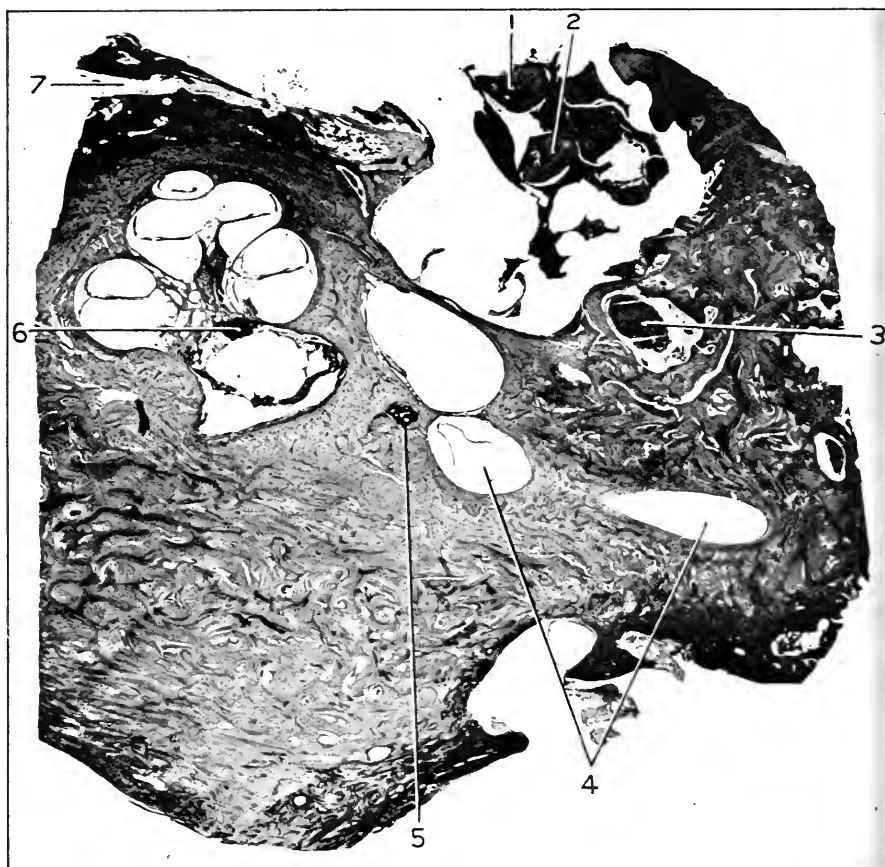


FIG. 13.—Fracture of cranial base without injury to labyrinth capsule. J. P.—, male, aged fifty-four. Horizontal section through right ear. No. 172.—1. Malleus. 2. Incus surrounded by blood-clot. 3. Facial nerve. 4. The two ends of the posterior vertical canal. 5. Haemorrhage in branch of vestibular nerve to ampulla of posterior canal. 6. Haemorrhage in fundus of internal meatus. 7. Haemorrhage in Eustachian tube. ($\times 6$.)

new connective tissue and bone in the vestibule and in the basal coil of the cochlea. The scala media was dilated, and the sensory cells and nerves were atrophied. (b) Nager² himself has examined the ear of an

¹ Manasse, *Virchow's Archiv.*, clxxxix.

² Nager, *Zeitschr. f. Ohrenheilk.*, liv.

old deaf-mute whose loss of hearing was due to an injury of the skull sixty years before death. In this case the line of fracture was not evident. The canals were obliterated by new bone, and the vestibule and basal coil of the cochlea filled up to a great extent by the same substance.

CASE 1.

The first case I wish to show is that of J. P——, a male, aged fifty-



FIG. 14.—Fracture of cranial base without injury to labyrinth capsule. J. P——, male, aged fifty-four. Horizontal section through right ear. No. 170.—1. Hemorrhage in modiolus. 2. Blood in perilymphatic aqueduct. 3. Cochlear opening of aqueduct. ($\times 12$.)

four, who was admitted to the wards of Mr. Charles (now Colonel) Cathcart, at 2 p.m. on December 6, 1910. I am greatly indebted to Colonel Cathcart for his kind permission to record these cases. The history of the case was that, while stepping out of the way of an automobile, the patient was knocked down by a cable car. On admission to the infirmary the patient was pale, irritable, and restless; pulse 64, temperature 96° F., respirations 28. Swollen, bruised areas were present on the back of the scalp and above the left ear. There were no

signs of injury to the body or limbs. There was profuse bleeding from the right ear, but *no flow of cerebro-spinal fluid* (as will be seen later, the labyrinth capsule in this case was not injured). The right pupil was more dilated than the left. Both reacted to light. Four hours after admission the patient became comatose and the breathing stertorous. The left arm was found to be more flaccid than the right. Operation at 7 p.m. by Mr. Cathcart. The right temporo-sphenoidal region was trephined, but no extradural clot was found. On incising the dura dark blood escaped, and a drainage-tube was inserted. Breathing was quieter for a time after operation, but again became noisy at 11 p.m. At midnight temperature 101.4° F., pulse 140. The patient died ten hours later.

Post-mortem.—The line of fracture runs along the roof of the middle-ear cleft. The middle meningeal artery is lacerated, and the roof of the tympanic cavity is splintered. The tympanum and mastoid cells are filled with blood. The jugular bulb is not injured. The fracture extends from the anterior part of the left middle fossa—where it crosses the groove for the middle meningeal artery—obliquely backwards through the squamous temporal and parietal bones to the lambda, and thence to the right parietal and squamous temporal regions. From here it passes down to a point behind the right petrous temporal, crosses the sigmoid sinus, and then runs along the anterior border of the right petrous bone.

Microscopic Examination of the Right Ear.

(1) *Middle Ear.*—The tympanic membrane is ruptured in its posterior part. Hæmorrhage is present in the mastoid antrum and cells and also in the tympanic cavity, but the joint between the malleus and incus appears normal. Blood is present in the sinus tympani and in the niche of the round window.

(2) The labyrinth capsule is not fractured, but hæmorrhage is present in the region of the geniculate ganglion, and the fibres of the seventh nerve are separated by blood. There is also some bleeding in the fossa subarcuata.

(3) *Labyrinth Contents.*—(a) The cochlea only shows slight hæmorrhages in the modiolus. The scalæ of the cochlea are free from blood, but there is a little hæmorrhage in the aqueduct of the cochlea towards its cranial end. (b) The hollow spaces of the vestibule are free from hæmorrhage, but there is a little blood in the ductus endo-lymphaticus just before it opens into the sacculus. The stapes is normal in the oval window. (c) The canals show no hæmorrhage either in the peri- or endo-lymphatic spaces.

(4) *Internal Meatus and Nerves.*—Hæmorrhage is present in the fundus of the meatus where the cochlear nerves enter the modiolus. There are also bleedings in the vestibular nerve and its branches to the superior and lateral canals, the sacculus and the ampulla of the posterior canal (see illustrations).

(To be continued.)

THE AMERICAN LARYNGOLOGICAL, RHINOLOGICAL, AND OTOLOGICAL SOCIETY.

Meeting at Chicago, June 15 and 16, 1915.

(Continued from p. 170.)

Vertigo of Labyrinthine Origin following a Chronic Suppurative Otitis Media with Cholesteatoma; 1st: Simple Mastoid with Curettage of the Middle Ear and Eustachian Tube; 2nd: Radical Labyrinth Exenteration.—Francis P. Emerson.—The otologist is particularly interested in those labyrinth cases which, in their final analysis confirmed by operation, may be readily labelled pathologically, and yet in their clinical manifestations may have presented a reasonable doubt as to the surgeon's attitude in regard to immediate operative interference. The relation of the vestibular apparatus to the brain demands exact diagnosis, and immediate surgical intervention in all pyogenic invasions of the labyrinth if life is to be saved. The case outlined is offered as one with delayed symptoms, and one which was perhaps less clear clinically than many.

The patient, male, aged sixty-two, was admitted to the Massachusetts Charitable Eye and Ear Infirmary, August 11, 1913, with a diagnosis of otitis media suppurativa chronica of the right ear. The case is summarised as follows: The patient is a man prematurely old. There is a perforation of the septum. His wife has had two miscarriages. The hearing test for his good ear, that is, the left, the writer has found to be strongly suggestive in other cases of lues, *i. e.*, a low note, but little, if any, raised, a positive Rinne with marked lowering of bone conduction, and the whispered voice reduced to $\frac{1}{25}$ or $\frac{1}{35}$. In this case there was a negative Wassermann, but no examination was made of the cerebro-spinal fluid. His eyes and a physical examination did not give evidence of specific disease. Could lues then be eliminated as a direct or contributory factor in this patient's symptoms?

The right ear gave a history of discharge for thirty years, and in addition there was a cholesteatoma, which, as is well known, is apt to invade the labyrinth. There were granulations in the posterior quadrant. The rotation test done several times always showed vestibular irritation when the vertical canals were in the plane of rotation. Unfortunately the difference in the after nystagmus between the turning to the right or to the left was not recorded. The fistula and caloric test were negative and there was no spontaneous nystagmus. The hearing test, done by two different observers, showed total deafness for the right ear, except a bone conduction of three inches. Can we say that this then was a case of diffuse purulent latent labyrinthitis, and that the apparent vestibular reaction was compensatory? According to Ruttin this does not occur unless a latent purulent labyrinthitis has existed for a long time and has been followed by a complete ossification of the labyrinth or sequestration. In this case there was no clinical history of vertigo until five weeks before admission, and our operative findings showed the horizontal canal free, while the superior and posterior contained a greyish-red granular, non-adherent detritus. There was no organised tissue or evidence of ossification present. The second day after operation we had a clear, serous

discharge resembling cerebro-spinal fluid. There was no facial paralysis and no sequestrum was found. On the other hand, the turning test was always positive.

Have we any evidence to suggest that this was a case of diffuse serous secondary labyrinthitis? The onset of the vertigo favours this supposition, and it is confirmed by the hearing test, which shows a remnant of vestibular irritation present. The operative findings are also consistent with this diagnosis; on the other hand, the caloric and fistular tests were negative, and there was no nystagmus at the time the patient was examined. The caloric reaction we know may be lost. If we assume that the portal of entry was originally by way of the oval window, could we not explain the failure at this time to obtain a positive fistular test by the presence of granulations in the posterior quadrant of the middle ear? We recognise that such an invasion is more often followed by a purulent labyrinthitis, but three cases of fifty reported by Ruttin were followed by the serous form. There remains then the absence of nystagmus to be accounted for. This is a symptom of irritation, and is, of the second degree, it might readily have been wanting at the time of observation. In the light of our symptomatology and the operative findings, the writer is inclined to consider the case one of a diffuse serous secondary labyrinthitis, as affording the only consistent diagnosis. For those who accept this interpretation, the division into two stages of the operative procedure, is perfectly consistent. If this diagnosis is accepted we must assume that there were no well-defined symptoms immediately following the mastoid operation, but that if present at all, they were but little marked, and only developed as a pronounced diffuse serous secondary labyrinthitis on the sixth or seventh day.

Dr. E. B. DENCH thought it a mistake to follow the foreign school in making a classification of these cases into serous, suppurative, or perilyabyrinthitis. Neumann, Ruttin, and others had said if a diagnosis was made of one or another kind, one must do one or another kind of operation. He thought Dr. Emerson's plan of treatment in the case under consideration the proper one. He had had cases in which, if he had followed the foreign school, he would have killed his patient. The results of the German operators did not show that their operative recommendations were always warranted.

Dr. NORVAL H. PIERCE, corroborated what Dr. Dench had said with reference to the foreign school and their methods. He cited a case, which had been under his observation at the Illinois Eye and Ear Infirmary, of acute otitis media, with obvious mastoid and labyrinthine involvement. The woman had had repeated attacks of discharge from the ear extending over a number of years, each time running an apparently normal course, until the last, when swelling and pain appeared over the mastoid. She complained of great dizziness. The caloric reaction was negative, as to both heat and cold. There was nystagmus to the opposite side. She was absolutely deaf in the diseased ear, as proved by Neumann's apparatus. There was no fistula. Here was a case for immediately going into the labyrinth, according to the German school. He had so completely abandoned their ideas that he had probably swung to the opposite extreme. He did not open this woman's labyrinth, and she recovered. This was one of six or more similar cases which had come under his observation during the past year. He did a simple mastoid operation. It was impossible to differentiate between suppurative, destructive labyrinthitis and serous laby-

rinthitis which was capable of recovery. The cases which he had observed for some length of time had recovered function so far as hearing was concerned. He believed one should never do a labyrinth operation when symptoms of meningitis were present: to operate under such circumstances would have very little effect.

Dr. EMERSON, in closing the discussion, said his object in presenting this case was to bring out just such remarks as those of Dr. Dench and Dr. Pierce. These cases should have a preliminary mastoid operation, and the labyrinthine operation only in the presence of evident signs.

The Labyrinth Operation; the Frequency with which it is demanded as determined by Hospital and Private Statistics extending over a Period of Ten Years.—Edward Bradford Dench.—

The author stated that it was the object of his paper to show by statistics the relative frequency with which labyrinth suppuration occurs as a sequel either of acute or chronic middle-ear involvement. Between 1904 and 1915 less than one-tenth or 1 per cent. of the cases of middle-ear involvement at the New York Eye and Ear Infirmary were subjected to the labyrinth operation.

Dr. Dench's own records, from May 1905 to May 1915, show 659 cases of acute mastoiditis and secondary mastoiditis operated upon, 533 cases of chronic middle-ear suppuration subjected to the radical operation, 23 cases of brain abscess, 33 cases of meningitis and 37 cases of sinus thrombosis. From 1907 to January 25, 1915, the same records show 22 cases in which the labyrinth operation was performed. These records would show that a labyrinthitis, demanding operation, is a most infrequent complication of a middle-ear lesion. Labyrinthitis occurred in only 2 per cent. of the operated cases of middle-ear suppuration.

Dr. Dench called a removal of a portion of the labyrinth a "partial" operation, and the free opening of the horizontal semicircular canal, the vestibule and the cochlea, thus securing complete drainage of the entire labyrinth, the "complete" operation. He performed the partial operation in 10 cases, and the complete operation in 12 cases. Of the cases in which the partial operation was performed, 7 were cured and 3 died; of the complete operation, 7 were cured and 5 died. Of the 3 cases of partial operation, 1 died of malignant disease and 2 of meningitis. Of the 5 fatal complete operation cases 4 died of meningitis and 1 of a pulmonary thrombus secondary to a jugular thrombosis. In 2 of the remaining fatal cases the operation was performed for the relief of an existing meningitis.

Dr. Dench concluded that the necessity of the complete labyrinth operation is comparatively infrequent, and that the operation should only be undertaken in the presence of very definite symptoms, pointing to either acute labyrinth involvement, or an acute exacerbation of a previous labyrinth suppuration. When these symptoms occur, operative interference is imperative, and must be prompt if it is to be successful. The expectant plan of treatment will probably be followed by the best results in cases of circumscribed labyrinthitis, or of a purulent labyrinthitis which is quiescent.

Dr. GEORGE W. MacKENZIE (Philadelphia), disagreed with Dr. Dench regarding the treatment of cases of circumscribed labyrinthitis in the semicircular canal by curetting and nothing more. Of course it was desirable to preserve the hearing as much as possible, but by curetting in the neighbourhood of a fistula, one would be apt to spread

the labyrinthitis. He had done this in one case, with loss of function in the horizontal position, but with retention of function in the vertical canals. In cases of labyrinth suppuration, with positive evidence that the labyrinth was dead, the labyrinth operation should be done at the same time that the mastoid operation was performed, otherwise the case was apt to terminate fatally. He had reported fifty-five cases, not his own, in which there were two fatalities. One was a case of Neumann's, and one Alexander's. Both these fatalities were due to the fact that the radical mastoid was done and the labyrinth left untouched, when the labyrinth should have been operated radically. There was some doubt in the minds of these surgeons as to the diagnosis of labyrinth suppuration, before the operation on the mastoid. The two errors were committed early in the experience of these men, at a time when the knowledge of the labyrinth was more limited than it is now. My present conviction concerning the subject of labyrinth suppuration is that we should not attempt any operation on the mastoid without at the same time draining thoroughly the labyrinth. Furthermore, that no operation on the mastoid or labyrinth should be attempted until a most careful examination of the labyrinth by all known tests had been made, and a positive opinion arrived at concerning the condition of the labyrinth. Circumscribed irritative conditions of the labyrinth (congestion) without the fistula sign did well with mastoid operation alone. Circumscribed destructive conditions would always tax the skill of the surgeon as to what was best to be done. Each case would need separate consideration as there was no fixed law by which one should be governed in all cases.

Dr. ARTHUR B. DUEL (New York City), thought it interesting to note the change of attitude with reference to these cases of suppurative labyrinthitis. When the Vienna school first promulgated their ideas, their plan was pretty generally adopted. No doubt many mistakes were made as a consequence. The general opinion among surgeons of the present time was to regard acute cases, whether suppurative or not, as unfavourable for operative intervention. These cases should never be operated in the acute stage unless there were evidence of a concomitant meningitis. It was much better to wait; for, if operated upon immediately, they were much more apt to die, by precipitation of the very complication they were trying to avoid. He had shared with Dr. Pierce the rather hopeless view of meningitis until last year, when he succeeded in curing a case by means of the Neumann operation and drainage at the internal auditory meatus, accompanied by repeated spinal punctures, drawing off twenty to thirty cubic centimeters of milky cerebro-spinal fluid, at the same time injecting back about 40 grains of urotropin in 15 or 30 c.c. normal salt solution. At each subsequent tapping of the cord, done at intervals of one or two days, six times, the fluid became more and more clear, until the patient finally recovered. He shared the belief of the majority, that in chronic cases if, at the time of operation, the gross appearances indicated the presence of a fistulous opening and necrosis, it might be necessary to open the labyrinth; otherwise it was better to wait for further symptoms.

Dr. MacKENZIE added that many cases of supposed labyrinthine suppuration of ten years, standing might present all the symptoms of labyrinthine suppuration, and yet there might never have been this condition, but instead, a chronic labyrinthitis of the plastic type. Unless, therefore, Dr. Beck, or someone else, had seen the case at the very

onset, with complete loss of function, it could not be pronounced a case of labyrinth suppuration. There must be typical signs of suppurative labyrinthitis. There was, with suppurative labyrinthitis, sudden, complete loss of hearing, loss of equilibrium, with negative findings by caloric tests, by galvanism, and by turning. Answering a question by Dr. Pierce concerning the method of differentiating between serous and suppurative labyrinthitis, the speaker said it was indeed difficult to make the differentiation early. Headache and fundus findings were guides. When present they suggested a suppurative type of labyrinthitis.

Dr. GEORGE L. RICHARDS asked whether the discussion concerned the perilymph or endolymph channels, whether within or without the membranous labyrinth. It made a great difference.

Dr. NORVAL H. PIERCE said the functional symptoms of serous and suppurative labyrinthitis were the same, and one condition could not be differentiated from the other. The only light thrown on the subject was that given by the meningeal complications. It was better not to operate until the meninges were involved.

Dr. DENCH, in closing the discussion, said, in answer to Dr. Richards' question, the subject involved both the perilymph and the endolymph, and was within the bony capsule. It could not involve the endolymph without involving the perilymph. That was just the hair-splitting question the German school had raised. He could not agree with Dr. MacKenzie with reference to the treatment of circumscribed labyrinthitis. He believed it wise, in the presence of a fistulous tract, to go in with the curette where this could be done without breaking down Nature's barriers to the course of infection. He removed all necrosis with a small curette.

(To be continued.)

Abstracts.

LARYNX.

Cancer of the Larynx complicated with Laryngocele.—Smith, Harmon, The "Laryngoscope," August, 1915, p. 560.

Laryngocele ventricularis may be due to playing on wind instruments or to sudden explosions of air, as in coughing. Harmon Smith records a case of a male, aged thirty-seven, who suffered from hoarseness, with occasional loss of voice, for two years. At times there was dyspnoea. For one month he had suffered from pain radiating towards the ears. Laryngoscopy revealed a large tumour of the left ary-epiglottic fold which pushed the epiglottis to the opposite side and obscured the cavity of the larynx. The tumour also projected into the neck just beneath the hyoid bone and was of a cystic or fatty consistency. Smith punctured the swelling, when there was a sudden expulsion of gas, accompanied by a noise like that made by the bursting of a toy balloon. After this the tumour had entirely disappeared, not only in the larynx, but also in the neck. Further examination now showed a large mass involving both true cords, ventricular bands, and the anterior commissure. The laryngocele appeared to be secondary to this malignant invasion of the larynx. The patient's breath had a cancerous odour, and both cords were slightly fixed. One cord was ulcerated. (Wassermann reaction

negative: no signs of tuberculosis.) Subsequent examinations showed that the air sac had refilled. Operation on the larynx was advised, but the patient died suddenly, probably from suffocation due to œdema. There was no autopsy. *J. S. Fraser.*

Laryngostomy.—**L. Mabler.** “Nord. Tidskr. f. Oto. Rhino. Laryng.,” Bd. 1, no. 1, p. 107.

Two cases reported. (1) A girl, aged seventeen, who had worn a tracheotomy tube for thirteen years. After many vain attempts to enable the patient to dispense with the tube, such as the introduction of Mikulicz's glass cannula, intubation, and so on, laryngostomy was tried, and with great success. The larynx was opened and its lumen dilated up by means of drainage tubes according to the method of Ferreri. After four months of this treatment it was found possible to leave off treatment with the tubes, and five months later the larynx was closed by Gluck's plastic operation. The result was excellent, the girl being able to speak with a strong resonant voice. (2) The second case was one of laryngeal papilloma in a boy, aged eight, in whom five attempts to get rid of the papilloma by endoscopic operation had failed. Laryngostomy was performed with the energetic removal of the growths and the mucous membrane, the cartilage being laid bare in some places. Twenty-five days after the operation the larynx was closed, and three months later no sign of any further recurrence could be found. The author is cautious in his expressions regarding the utility of laryngostomy, but he believes that it furnishes an operative method which may lead to further developments. *Dan McKenzie.*

Foreign Bodies in the Bronchi complicated by General Emphysema.—**Lynch, Henry.** The “Laryngoscope,” August, 1915, p. 574.

Lynch records two cases. (1) Boy, aged eight, was admitted with a diagnosis of laryngeal diphtheria. On examination extensive subcutaneous emphysema was found extending to the neck, face, chest, arms, hands, and the abdomen down to Poupart's ligament. There was slight exudate on the tonsils and the uvula had disappeared, but this was due to a recent tonsillotomy. Wheezing and cough were present. Antitoxin was given. Next day the symptoms had markedly progressed and intubation was performed, but did no good. The tube was at once removed, and thereafter a cast of membrane was coughed up. Direct laryngeal examination showed no exudate, but marked sub-glottic infiltration was present. Bronchoscopy revealed patches of membrane and ulceration in the trachea and right bronchus. Lynch was unable to ascertain the cause of the emphysema. The patient made a slow convalescence and suffered from cardiac weakness and paralysis of the palate. The cultures taken by the direct method were all positive. Case 2.—Boy, aged three, had a violent choking spell while eating carrot. The child's father administered first-aid by spanking and poked his fingers down the child's throat and removed a piece of carrot. After that the child was able to breathe. Paroxysmal attacks of coughing, however, continued, and four days later Lynch found the patient *in extremis*. Marked subcutaneous emphysema was present as in the first case. Direct laryngeal examination showed that the upper aperture of the larynx was swollen and glistening. A small bronchoscope was introduced to act as a guide for low tracheotomy, and also to give air.

On opening the trachea there was no expiratory cough. A 7 mm. tracheoscope was introduced, and a large piece of carrot pulp removed from the right bronchus before death. *Post-mortem*.—The superior mediastinum was emphysematous and the visceral pleura was covered with blebs, but there was no pneumothorax. The pericardial sac was ballooned with air. The trachea and main bronchi showed no emphysema, but there was a small piece of carrot pulp impacted in the branch to the right upper lobe: a portion of this lobe was collapsed. The branches to the middle and inferior lobe were not occluded, but these lobes were enormously emphysematous. The left main bronchus contained a small piece of the pulp, while the fourth and last piece of carrot was lodged in the branch to the left lower lobe, at which point there was a fairly well-defined abscess. Lynch suggests that some of the emphysematous blebs ruptured into the mediastinum and that the air thus got out into the connective tissue planes.

J. S. Fraser.

NOSE.

The Innervation of the Nasal Chambers.—Brubaker, A. P. "Annals of Otology, etc.," xxv, 607.

A good exposition of the subject. The facts, taken collectively, show that the physiological conditions of the nasal chambers require for their maintenance a complex nerve mechanism: a mechanism which, however, may be easily impaired and rendered unstable by internal causes, whereupon it acts in an abnormal manner, and thus lays the foundation for the development of pathological states of longer or shorter duration.

Macleod Yearsley.

Vagotonia, apparently originating in the Nasal Accessory Sinuses.—Fetterolf, Geo. "Annals of Otology, etc.," xxv, 587.

Vagotonia is a condition of excitement or hypertonus of a group of nerves called the "extended vagus." This latter phrase is applied to a nerve series which includes not only the pneumogastric, but also a group of nerves with similar function. Antagonistic to the vagus group is the sympathetic, and there exists a condition thereof called sympatheticonia, which is a state of excitement or hypertonus of the sympathetic system.

The case, was a lad, aged twelve, and his condition dated from measles at seven. He suffered from profuse night sweats, coughing, sneezing, expectoration, and nasal discharge. Improvement ensued, when it was discovered that there was chronic suppuration of the left posterior ethmoidal and sphenoidal cells.

Macleod Yearsley.

Suppuration of the Accessory Nasal Sinuses as a Possible Ætiologic Factor in Multiple Sclerosis.—Stark, H. H. "Annals of Otology, etc.," xxv, 710.

Impressed with the similarity of the eye symptoms in accessory sinus suppuration and multiple sclerosis, the author was induced to look into the subject. The eye symptoms in multiple sclerosis are amblyopia, nerve involvement, muscle involvement, including nystagmus, changes in the pupil and field of vision. These are taken in order and examined in relation to suppurative sinusitis. The paper is inconclusive.

Macleod Yearsley.

Chronic Frontal Sinusitis, Sphenoiditis, Meningitis.—Imperator, C. Johnstone. "Laryngoscope," 1915, p. 580.

Male, aged twenty-six, brass-worker, had suffered for many years from ozena and tuberculosis of the left lung. A skiagram showed double frontal sinusitis, and the other accessory sinuses were also involved. A Killian operation was performed, and the sphenoidal ostium was enlarged. The patient remained well for four years, but after that suffered from severe headache. The anterior wall of the sphenoid sinus was now removed. Later the patient complained of nausea, vomiting, and dizziness. The track leading to the frontal sinus was dilated, but a second operation of the left frontal sinus had to be performed and the sphenoidal cavity curetted. Three days later the patient had diplopia followed by drowsiness. Temperature, 101° F. The patient suddenly became aphasic, and the right arm and right side of the face were paralysed. An exploratory operation was performed in the left temporal region, but nothing was found. The posterior wall of the left frontal sinus was then removed and the brain explored with negative results. After this the patient improved slightly, but later became comatose and died. *Autopsy.*—Dura mater thickened and adhering to brain. Basal meningitis present, especially in the region of the sphenoid, where there was an abscess. The bone, however, appeared healthy. No brain abscess. Bacteriological examination of the cerebro-spinal fluid showed a small bacillus resembling the influenza bacillus.

J. S. Fraser.

Goldstein, Max A.—Lipoma of the Maxillary Antrum. "Laryngoscope," 1915, p. 142.

Goldstein's patient was a man, aged forty-two, who complained of a foul-smelling suppurative condition in the left side of his nose. The maxillary antrum and the hard palate were involved. There was a history of syphilis with previous necrosis of the floor of the nose, and the patient complained of pain in the left nasal and frontal area. On examination the septum was deflected to the right and the nose was bathed in profuse, thick, greenish pus, which showed many bone particles. A probe could be passed into the left antrum through a fistula in the hard palate. When this was done, a soft and yielding tumour mass was met with. The radical operation on the left antrum was performed under local anaesthesia, and the cavity was found to be filled with a fatty tumour which was pinkish-white in colour and soft to the touch, but apparently had a well-marked capsule, which proved to be the lining membrane of the antrum. A large sequestrum was removed from the opening in the hard palate. Anti-luetic treatment was instituted, and the case did well. The opening in the hard palate was subsequently covered by a special plate. The pathological report stated that the cells of the growth were typical fat cells of the adult type.

J. S. Fraser.

ŒSOPHAGUS.

Œsophageal Stricture.—Pritchard, Eric, and Baukart, A. S. B. "Proceedings of Royal Society of Medicine" Section, Disease in Children, November, 1916, p. 15.

The case reported is that of a boy, aged four, who was admitted to hospital for wasting. There was no history of swallowing corrosive, hot fluid, or foreign body. Six months before admission, the patient gradually lost his appetite, but was not sick after food. Four months before admission, he began vomiting a little every time after taking

solid food, but he never brought up the whole meal. The vomiting occurred at varying intervals after meals. He could keep down fluids and semi-solids. The attacks of vomiting became more frequent, sometimes twice after a meal and the amount vomited larger. The interval between taking food and the vomiting became shorter, and finally the vomiting always occurred either while taking food or immediately after taking it. Also, the whole meal was vomited. The patient was generally able to keep down small quantities of fluid.

X-ray report: There is an œsophageal stricture at the level of the fifth dorsal vertebra. It is very tight, only allowing fluids to pass slowly, and stopping bread and milk until regurgitation occurs. The gullet above is dilated to the level of the third thoracic vertebra by the retained food: above this point any added food is regurgitated. The channel of the stricture seems annular and smooth. No alteration in its size or intensity took place during ten minutes' observation.

Examination with œsophagoscope: A full-sized bougie was passed down the œsophagus as far as the stricture. After much difficulty a No. 8 gum elastic catheter was passed through the stricture. This was gripped so tightly that it was very difficult to withdraw it.

Since the last œsophagoscopy the boy has been able to take semi-solid food, a thing which he could not do before. *Archer Ryland.*

E.A.R.

Spontaneous Cure of Unrecognised Sinus Thrombosis accidentally discovered during operation.—Day, E. W. The "Laryngoscope," November, 1915, p. 757.

Day holds that there is a far greater number of cases of sinus thrombosis from aural infections than is generally supposed. He believes that if the clot in the sinus does not break down and discharge freely into the general circulation we do not get the classical symptoms—hectic temperature, rigors, and sweating. Day classifies his forty-five cases of sinus thrombosis into three general groups: (1) Those in which the septic material is drained directly into the veins or aspirated into the opposite sinus (thirty-six). (2) Those in which the distal ends of the clot remain firm and become organised, the centre breaking down and draining through a rupture of the sinus wall (three in number). (3) Those in which the entire clot becomes organised and sterile with obliteration of the sinus (six). Group 2. In all three cases in the second group there was a perforation of the posterior wall of the mastoid cavity over the sinus. The rupture of the sinus took place at this point and the contents discharged into the necrotic mastoid cavity. The symptoms were not distinctive or severe, but resembled those of a mastoiditis with an epidural abscess. All made an uneventful recovery. Group 3. In all of the six cases belonging to Group 3 the diagnosis was made on the operating table and was not previously suspected. Day remarked that he will never know how many have passed unrecognised.

CASE 1.—Male, aged fifty-two, had had several attacks of acute middle-ear suppuration. In March, 1910, he had another attack complicating influenza. The patient complained of frequent attacks of giddiness and occasional vomiting, but there was no history of fever, chills, or sweating. The ear discharged for one month only, but the patient complained thereafter of headaches which increased in severity. He became irritable and had hallucinations. On examination the drumhead was intact but injected, and there was tenderness half an inch below and

behind the mastoid antrum. A radiograph showed the affected (right) mastoid to be opaque. At the operation Day found that the mastoid was sclerotic, but there was no pus or necrosis. The sinus was yellow in colour and normal in size but obliterated by firm fibrous tissue, removal of which was attended with only partial success. Healing was rapid; the headaches and hallucinations disappeared. **CASE 2.**—A middle-aged male suffered from acute suppurative otitis media after measles. Two months later the ear was still discharging (pneumococcus on culture). No fever or chills. Operation showed a large mastoid filled with granulations and pus. There was a perisinus abscess over the upper knee but no granulations on the sinus. Sinus opened and found to be filled with a firm clot. Microscopic examination showed that this was becoming organised; no organisms were found in it. **CASE 3.**—Female, aged twenty-two, suffered from recurring discharge from the right ear for sixteen years. September 1, 1914: Acute pain in right ear. Patient feeling chilly; temperature 101° to 104° F.; headache and delirium for one week. Headaches then disappeared, but on three occasions the patient became cyanosed for two or three hours. The irregular temperature lasted four or five weeks and there was tenderness along the anterior border of the sterno-mastoid. Day only saw the case December 18, 1914. Middle-ear cavity filled with granulations and foul pus. Radical mastoid operation showed that Nature had performed a "Stacke" operation, while the posterior mastoid wall was absent and the sinus was covered with granulations. When uncovered the sinus was seen to be yellowish, hard, and tense. A small exploratory incision showed it to be totally occluded with organised tissue. The operation cavity was completely dry in five weeks. **CASE 5.**—Boy, aged seven, had suffered from middle-ear suppuration from infancy. Patient admitted for an acute exacerbation with large swelling behind the ear April 7, 1915. At operation the mastoid was necrotic and the cavity contained much cholesteatoma. Necrosed bone over sinus removed. Sigmoid sinus yellowish and firm. Exploratory incision showed complete obliteration.

Day holds that nine atypical cases of sinus thrombosis (Groups 2 and 3) out of forty-five (20 per cent.) would seem to justify the conclusion that absence of the classical symptoms does not justify the assumption that there is no thrombosis. In 13.5 per cent. of the cases Nature had effected a cure.

J. S. Fraser.

Ear Affections and Diabetes.—**Zimmermann, Chas.** "Annals of Otology, etc.," xxv, 637.

Contains a useful bibliography and short reports of six cases. Although no ear disease is peculiar to diabetes, there can be no doubt that the latter has an unfavourable influence on the course and healing of ear affections, imparting to them a certain anatomical and clinical character. With regard to operative measures, its presence demands the most serious consideration. On the other hand, ear diseases may induce glycosuria.

Macleod Yearsley.

Septic Thrombosis of the Jugular Bulb, with Repeated Formation of Septic Thrombi in the Sigmoid and Lateral Sinuses, with Reference to the Literature on Involvement of the Torcular Herophili in such Cases.—**Page, J. R.** "Annals of Otology, etc.," xxv, 595.

Case of a child, aged twelve. The chief interest in the paper is in the reference to the literature.

Macleod Yearsley.

MISCELLANEOUS.

The Diagnosis and Management of Vasomotor Disturbances of the Upper Air Passages.—J. L. Goodale. "Annals of Otology, etc.," xxv, 527.

In a large proportion of these cases the disturbing element is the entrance of a foreign proteid into the system, either through the respiratory or gastro-intestinal mucous membranes. Foreign proteids may also develop in or upon the mucous membranes through autolysis of pathogenic or saprophytic bacteria. The application of the skin test to these conditions is of diagnostic value when employed with a recognition of the phylogenetic relationships of animals and plants as determined by studies in serobiology.

Proteid for testing should be prepared from the keratin and sera of domestic animals, pollen of the chief causes of hay fever, various articles of food, and from various bacteria which invade the respiratory tract.

When the skin reactions have been determined, management of cases will depend largely on the relative preponderance of the local reactions to the clinical history. Septic foci should be removed. Vaccine therapy is likely in such anaphylactic cases to be more accurately guided than in the ordinary individual.

The results already accomplished have led the author to the conclusion that we possess in the intelligent application of the skin test a very definite aid in the diagnosis and consequent management of cases of vasomotor disturbances of the upper air passages, although we are as yet only at the entrance of this field of work. *MacLeod Yearsley.*

OBITUARY NOTICE.

PROF. FERDINANDO MASSEI, NAPLES.

Born July 25, 1847. Died March 7, 1917.

IN the death of Massei, of Naples, Italian laryngology has lost its *doyen* and all who knew him have lost a dear and charming friend. For some of the following notes of his career we are indebted to a notice by Dr. Grazzi in the *Bollettino delle Malattie dell'Orecchio*, etc.

Ferdinando Massei came of a good family in Naples, where he was born, studied, and qualified. In the year 1868 he started a *Wanderjahr* through Europe and was much impressed with the importance of laryngology, which was then in its infancy. He decided to devote himself to it, and therefore followed the clinics of Mandl and Waldenburg in Germany, Fauvel in Paris, and Morell Mackenzie in London. Returning to Naples at the end of 1869 he commenced practising in the speciality he had selected, opening a free dispensary for diseases of the nose and throat, and he soon attracted numerous doctors and students. A few years later the University recognised his course of lectures. In 1882 he was made *Liber Docent*, and from that year until the day of his death at the age of seventy he taught regularly, and, in a letter in February last, he laments that his clinic was so crowded. He was made Professor in 1902.

After the death of Prof. Cozzolino, the Chairs of Otology and Laryngology were united, and at my last visit to Naples, a few years ago, I found Massei very satisfied in having, at last, a well-equipped clinic.

Massei was a hard worker and a ready writer. He himself founded the *Archivii Italiani di Laringologia* in the year 1880 and remained its director up to the last. We have frequently made abstracts from it in these pages.

Besides, he must have himself written more than 200 articles, and amongst them we recall the following: "Peri-tracheal Abscess in Children," "Laryngeal Complications of Carcinoma of the Skin," "Congenital Laryngeal Stridor," "Erysipelas of the Larynx," "Treatment of Laryngeal Papillomata *per vias naturales*," and "Anæsthesia of the Larynx in Recurrent Paralysis." He wrote a treatise on "Diseases of the Nose and Throat," which was translated into German, Spanish, and Russian, and is still well worth studying. He was justly proud of his statistics of laryngeal tumours, for he doubtless had a larger clinical experience of these than any other laryngologist in Europe.

He held numerous hospital appointments in Naples. He was Superintendent of the Diphtheria Hospital, where he was one of the first to employ intubation. Indeed, he was Honorary Consulting Laryngologist to nearly all the hospitals of Naples, and his services were not merely honorary, as he was always ready to give practical help at almost any hour.

It is not necessary here to enumerate all the learned societies of which he was a member, but it might be recalled that he was one of the Founders, and later a President, of the Società Italiana di Laringologia, Honorary Fellow of the old Laryngological Society of London, and that he was the sole representative of Italy amongst the select ten Honorary Fellows of the American Laryngological Association.

As he "arrived" early, was a leader of Italian laryngology, and inhabited the largest city in the Peninsula, it is not surprising that he had a very large practice. But he was a generous man and was never happier than when helping the poor. The commercial side of the profession was his last thought, and he was fond of saying that the consciousness of work well done was our best reward and that money was only a means for living.

Massei was not only energetic and learned, but his mind was nimble and he had a ready flow of well-chosen words. Hence, he was always welcome at scientific gatherings, and although he had not been to England for some years, many of us had the pleasure of meeting him at the International Medical Congress in Rome or the Otological Congress in Florence. At these Congresses he was the more welcome, as he was generally accompanied by his charming wife, who possessed so much of the well-known fascination of her countrywomen that, whenever I met her, I was reminded of the poet who described the daughters of that sunny land as having:

"Gli occhi stellanti e le serene ciglia
La bella bocca angelica, di perle
Piena, e di rose e di dolce parole."

As Dr. Grazzi writes, Massei cannot easily be replaced: he was a genius in his own line and he passes away amidst the admiration and regret of all his colleagues.

We venture to transmit the sympathy of his colleagues in this country to his family and to his son, Prof. Raffaello Vitto Massei, whose writings we have already had the pleasure of reviewing in this Journal, of which Massei himself was one of the oldest and most faithful friends.

STCLAIR THOMSON.

THE
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**BONY TUMOUR OF THE NASO-PHARYNX SIMULATED BY
MALPOSITION OF CERVICAL VERTEBRÆ; REPOSITION;
GREAT AMELIORATION.**

BY EDGAR F. CYRIAX, M.D. Edin.

In the November number of the *Practitioner*, 1916, vol. xevii, pp. 464-471, I made a communication on the subject of minor displacements of the vertebræ and ilia. As an illustrative case I submit the following:

Miss —, aged twenty, student of music, came to me on March 22, 1915, on the recommendation of Dr. Dundas Grant.

History.—There was no record of any traumatism. The patient had been having singing lessons for nearly two years, but all efforts to correct poor resonance had not resulted in any improvement; she also suffered a good deal from sore throat. In consequence she went to consult Dr. Dundas Grant during February, 1915. He found on examining the naso-pharynx with a mirror that there was a projection on its posterior wall; digital examination revealed that it was of a bony nature. He considered that the diagnosis lay between a bony outgrowth or a forward displacement of cervical vertebræ. She was advised to have a skiagram taken, which was accordingly done by Dr. Stanley Melville on March 10. His report was as follows: "Comparing the present appearances with that of the normal cervical spine, there is obviously a rotation of the axis, this rotation being also noticeable in decreasing ratio in the third, fourth, and fifth vertebræ, the sixth showing no such rotation. The atlas appears to be normal in position" (see Fig. 1). In view of this finding, Dr. Grant saw the patient with me and asked me to try and replace the affected vertebræ.



FIG. 1.—The transverse process of the axis, as indicated by the arrow, can be seen to project about $\frac{1}{2}$ cm. in front of the body of the vertebra.

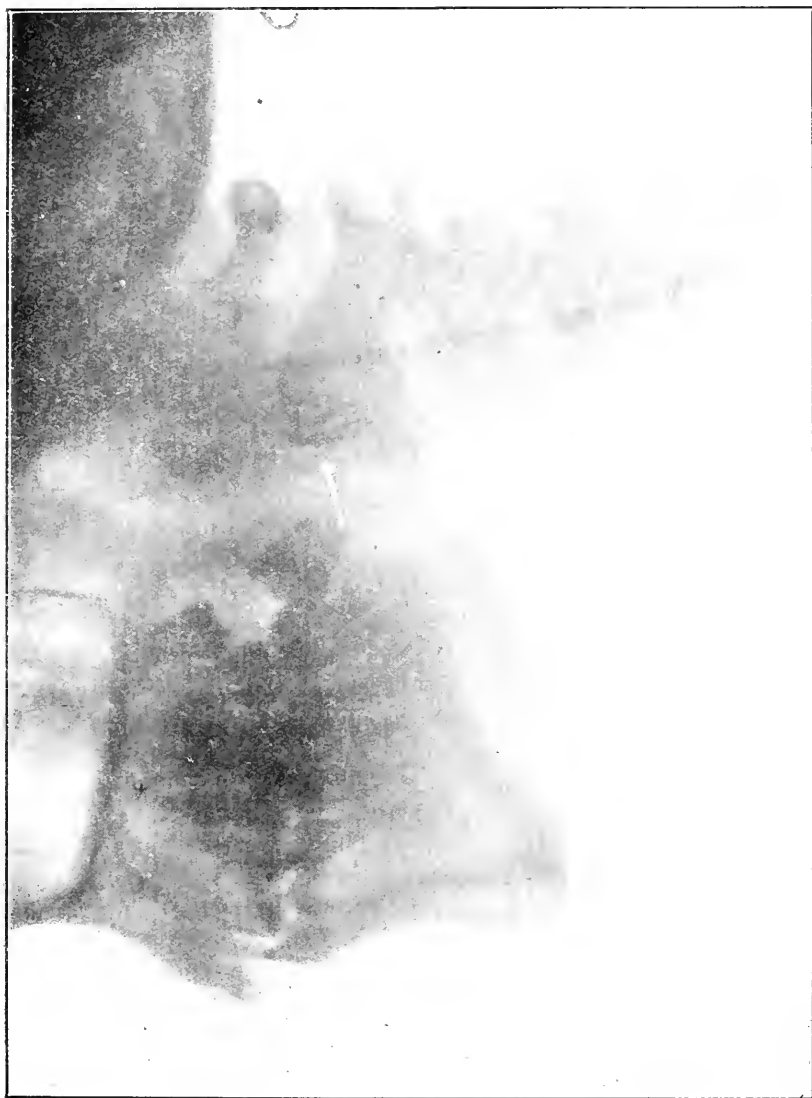


FIG. 2.—The transverse process of the axis, as indicated by the arrow, can be seen to project just beyond the body of the vertebra.

Examination.—Before commencing my treatment I examined the patient on two separate occasions, March 22 and May 13, and on both times found the same state of affairs. The patient's speaking voice was not resonant, and her singing voice also lacked resonance, being rather feeble and not carrying far. The patient had a tendency to keep her head forwards; efforts at holding it straight very soon induced fatigue. After practising the violin for some time her neck began to ache, this commencing high up on the right side and then spreading all over. It ceased about ten minutes after having stopped playing.

As regards movements of the head, there was specially noted limitation of rotation to the left. When lying flat on her back, passive rotation to the left could not proceed through more than about 65° ; attempts to carry it further resulted in reflex contraction of the cervical muscles and compensatory rotation by elevation of the right shoulder. The patient herself stated that the movement was "stopped by something being in the way." Rotation to the right was also limited to about 80° , after which contraction of the cervical muscles and elevation of the left shoulder resulted. Active attempts at these movements showed the same limitations as the passive efforts.

On palpation the spinous process of the axis was deviated to the left; the spinous process of the third cervical vertebra was also somewhat deviated, being to the right of the spine of the axis but to the left of the spine of the fourth cervical vertebra.

Dr. Grant also found, at the original examination, that there was present a well-marked deflection of the nasal septum into the nostril, which produced considerable nasal obstruction, and he found it necessary to perform a submucous resection before the cervical vertebral adjustments were attempted. This operation was accordingly done on April 15; as an immediate result the patient was enabled to breathe better through her nose. The patient then abstained from all use of the voice for three weeks, and at the end of the time she experienced some improvement in the resonance of the singing voice, especially in the nasal cavity.

On May 13, 1915, I commenced the treatment of passive cervical adjustment, and between this date and June 5 in all fifteen such treatments were administered. Each application consisted of a preliminary petrissage and stretching in order to induce relaxation of the cervical muscles and ligaments, followed by rotary movements in the direction of limitation of movement. The average duration of each application was about eight to ten minutes. The

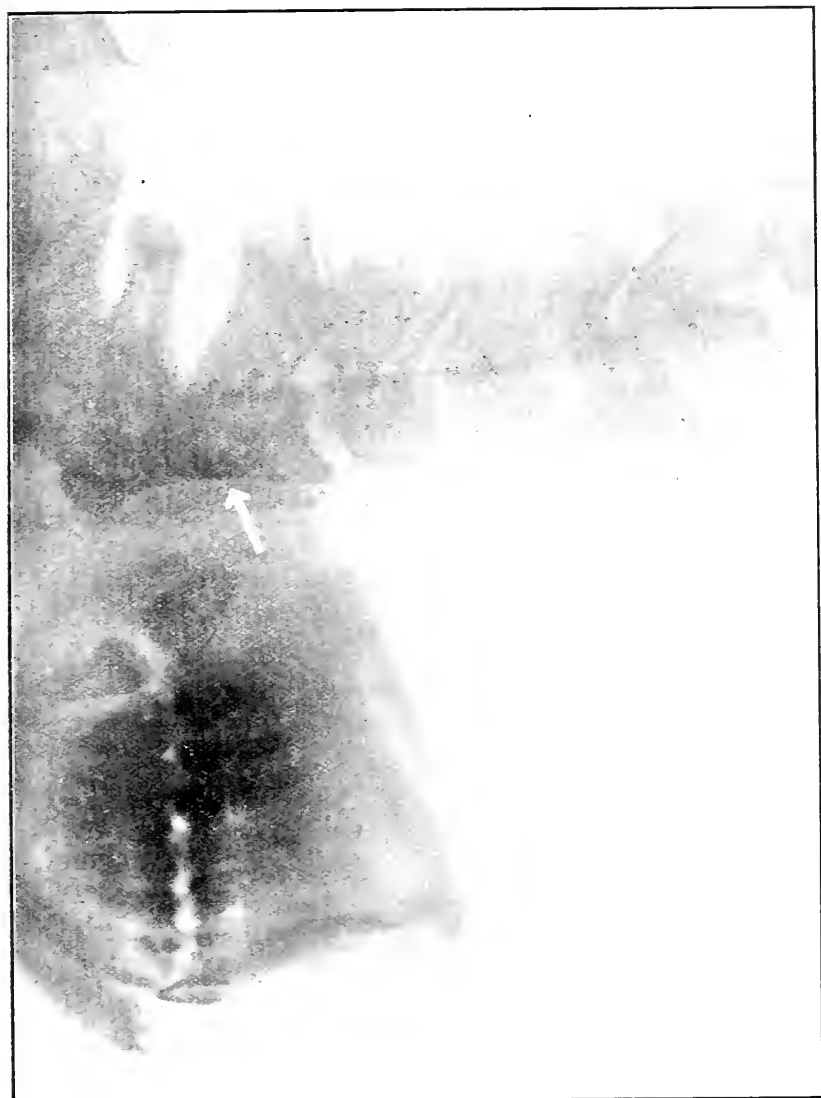


FIG. 3. The transverse process of the axis, as indicated by the arrow, can be seen to be flush with the body of the vertebra.



FIG. 4a.

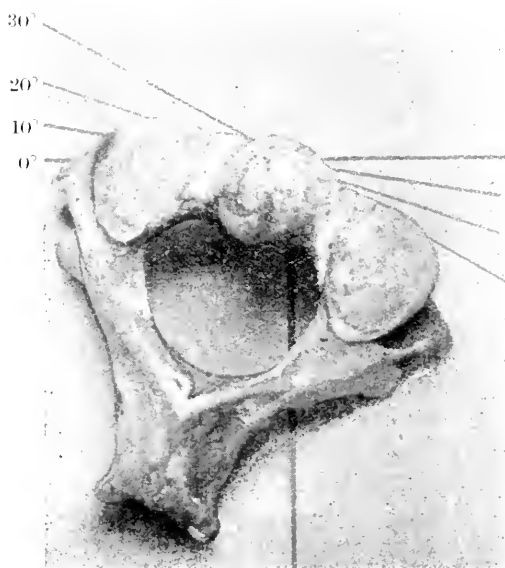


FIG. 4b.

FIG. 4a.—An axis vertebra rotated so as to present the appearance in Fig. 1, *i. e.*, so that the transverse process, as indicated by the arrow, projects $\frac{1}{2}$ cm. in front of the body.

FIG. 4b.—The same as Fig. 4a, but viewed from above. The amount of rotation can be seen to be about 23°.

actual adjustments were absolutely painless, not even causing discomfort either during or after their application.

Progress.—May 15: The axis moved to-day for the first time, and continued to do so at each visit henceforth until May 28. May 17: The third cervical vertebra moved into position. By this date the patient, her mother, her professor of singing, and myself had all found improvement in the speaking and singing voice resonance. May 28: Passive rotation of the head is now equal on both sides, and can be performed through 90° on each side, no reflex contraction of muscles or elevation of the shoulder occurring. Patient herself informs me that it no longer tires her to hold her head up and that her neck muscles feel stronger. Her violin master tells me that he notices a marked difference in the way she holds her violin, being now more erect and firmer. No more neck-ache when playing on her instrument. Voice resonance considerably better, both as regards speaking and singing, but more especially the latter, and this is at once evident when she sings the same song as on the previous occasions; her professor of singing also testifies to the voice improvement. As regards the position of the cervical vertebræ, there is no longer any deviation detectable by palpation of the axis and third vertebræ; they lie in the same straight line as do the spinous processes below their level. The next few treatments were directed to improving the circulation in the cervical muscles by passive elongation in every direction.

On June 1 I again saw the patient together with Dr. Grant. He found that the naso-pharynx was more roomy and that the bony projection was decidedly less prominent than before. On June 4 a second skiagram was taken by Dr. Melville, whose report is as follows: "The malrotation in all the cervical vertebræ has been so far corrected that the position is normal as regards the third, fourth, and fifth, and the axis so much improved that the shadow of the articular process barely overlaps the shadow of the body" (see Fig. 2).

June 5, 1915: Treatment finished, there having been no more adjusting movements in the cervical vertebræ since May 28. November: No return of any symptoms. Improvement in the voice fully maintained. December 6, 1915: Dr. Grant saw the patient again to-day, and found the condition as regards respiration still quite satisfactory. The patient reported to him that her professor of singing was extremely pleased with the improvement in the vocal resonance.

June 6, 1916: I saw the patient again to-day and was able to

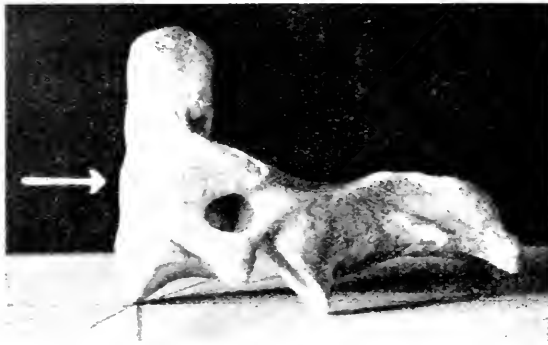


FIG. 5a.

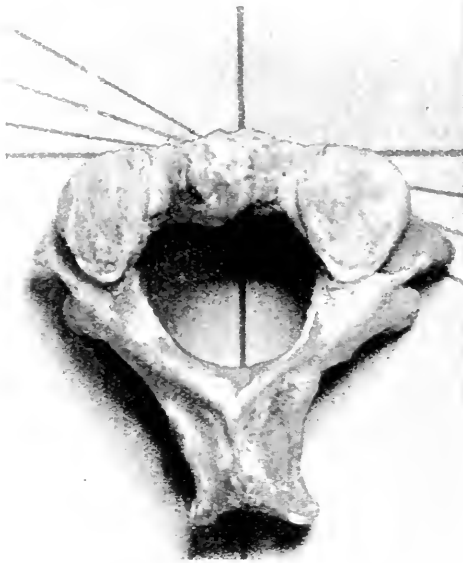


FIG. 5b.

FIG. 5a.—An axis vertebra in correct position, as in Fig. 3. The transverse process, as indicated by the arrow, does not project in front of the top of the body.

FIG. 5b.—The same as Fig. 5a, but viewed from above.



FIG. 6a.



FIG. 6b.

FIG. 6a.—A fourth cervical vertebra rotated so as to present the appearance in Fig. 1. The transverse process, as indicated by the arrow, can be seen to lie just behind the top of the body of the vertebra.

FIG. 6b.—The same as Fig. 6a, but viewed from above. The amount of rotation can be seen to be about 10° .

obtain a further slight rotary movement of the axis to the left. November 22, 1916: The patient came once more to see me. I could not obtain any further movement of the axis. In view, however, of the fact that some such rotation had been obtained subsequent to the taking of the second skiagram, a third one was taken by Dr. Melville on November 24, who reported as follows: "The shadow of the articular process of the axis no longer projects in front of the body."

On February 9th, 1917, I again saw the patient with Dr. Grant. He found the condition to be practically the same as on June 1. The improvement in respiration and singing voice has been fully maintained.

In order to estimate the actual amount of malrotation of the axis and fourth cervical vertebræ, actual vertebræ were taken, placed on a horizontal board, and while being viewed laterally, were rotated until their appearance corresponded to that in the first skiagram. They were then viewed from above and the amount of rotation estimated. Thus Fig. 4*a* shows an axis vertebra rotated until the transverse process lay about $\frac{1}{2}$ cm. in front of the top of the body as in Fig. 1. Incidentally this reproduced the foreshortened appearance of the whole bone. Fig. 4*b* shows the vertebra in the malrotated position as seen from above; the amount of malrotation can be seen to be about 23° . Figs. 5*a* and 5*b* depict an axis vertebra in the correct position as viewed from the side and above. Fig. 6*a* shows a fourth cervical vertebra rotated so as to present the appearance in Fig. 1, *i. e.* so that the transverse process lies just behind the top of the body. Fig. 6*b* shows the vertebra as seen from above; the amount of malrotation can be seen to be about 10° . Fig. 7*a* shows the same vertebra as in Figs. 6*a* and 6*b*, but in normal position, as in Fig. 3. The transverse process can be seen to lie about $\frac{1}{2}$ cm. behind the top of the body.

I consider in this case that the displacement of the axis was the primary lesion, that in the vertebræ below it being secondary.

Malrotations of the axis are fairly common, though it is rare to find one so great in amount causing no subjective symptoms beyond the minor ones of deficient voice resonance and recurring sore throat. Dr. Grant tells me that laryngologists have hardly given any attention to the possibility of cervical displacements causing bony projections into the naso-pharynx. One of the few authors who refers to them is Zuckerkandl (*Anatomie normale et pathologique des fosses nasales*, 1895, vol. i, p. 603). Personally I have



FIG. 7a.

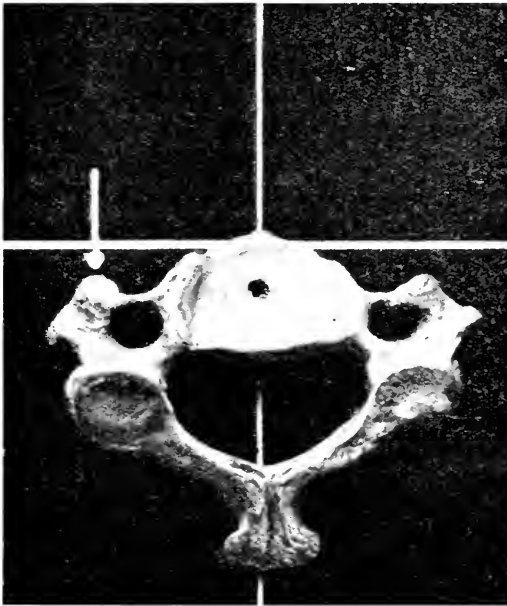


FIG. 7b.

FIG. 7a.—A fourth cervical vertebra in correct position, as in Fig. 3. The transverse process, as indicated by the arrow, lies about $\frac{1}{2}$ cm. behind the top of the body.

FIG. 7b.—The same as Fig. 7a, but viewed from above.

examined a large number of text-books on diseases of the nose and throat and failed to find anything on the subject.

In conclusion I beg to tend my sincerest thanks to Dr. Grant for permission to publish this case, and to Dr. Melville for having taken the skiagrams.

CLINICAL RECORDS FROM A PROVINCIAL HOSPITAL.

BY NEIL MACLAY, C.M.,

Hon. Surgeon, Throat and Ear Hospital, Newcastle-on-Tyne.

(*Concluded from p. 215.*)

4. Tuberculosis of the Larynx; Tracheotomy; Improvement.

R. B——, a coal-miner, aged thirty-six, was admitted in July, 1915, on account of urgent laryngeal obstruction. He exhibited the common underground worker's complexion with a superadded degree of cyanosis, and he looked like a man who had lost weight. The extra respiratory muscles were in obvious use and there was sucking in of the intercostal spaces. The temperature was sub-normal and the pulse rather poor and accelerated. The urine was normal. There was no evident pathological change in nasopharynx or mouth. Examination of the lungs was negative.

Condition of Larynx.—The true cords, and to some extent the ventricular bands, were seen to be occupied by pale pink fleshy-looking masses, which in parts had a papillomatous appearance. The papilloma-like areas were greyish in colour. The inter-arytenoid space contained an irregular, cockscomb-like projection. Ulceration was not apparent. The arytenoids were only slightly tumefied, and there did not appear to be any change in the ary-epiglottic folds or the epiglottis. The glottis was reduced to vanishing point.

Family and personal history good.

History and Present Condition.—Gradual onset of huskiness nine months ago, and this was associated with a dry cough and general feeling of weakness. Physical weakness ultimately compelled him to stop working at the end of 1914. He lost four stone in weight in about six months.

Treatment.—Very soon after admission the trachea was opened above the thyroid isthmus under local anæsthesia. Before opening the windpipe a few drops of a 2½ per cent. cocaine solution were injected into the lumen, a procedure which entirely

prevented any subsequent coughing. A medium-sized Parker cannula was employed.

A few days later, under CHCl_3 anaesthesia, the larynx was approached by means of Hill's slotted tube spatula, and the appearances noted by the indirect method were confirmed. The fleshy new formations were freely removed, and after bleeding had in great measure been controlled by pressure, the raw surfaces were swabbed with a solution of lactic acid, formalin, and carbolic. After the lapse of a week the patient was kept mostly in the open air and he was well fed. The larynx was carefully swabbed twice a week by the aid of the indirect method with formalin and lactic acid solution.

The new growth was examined by Prof. Stewart McDonald and described by him as tubercular. Sanatorium treatment was resolutely refused, and at the end of six months the patient begged to have the cannula removed. This was done reluctantly, and thereafter the patient was entirely lost sight of till March 12 of this year (1917), when he turned up of his own accord to report progress.

I find that after getting rid of the cannula he went to Saltburn-by-the-Sea for a month, and continued living leisurely at home till August, 1916, when he resumed work as a miner. He has regained his lost weight. He looks well and says he feels well. There is a little stridor noticed, but he does not seem to be inconvenienced even during exertion. The interior of the larynx presents the appearance of rugged cicatrisation, and there is unmistakable harrowing of its lumen. There are no signs noted in the chest.

5. Epithelioma of the Nose, superimposed on a Tubercular Lesion.

D. R.—, aged twenty-three, presented himself at the clinic early in April of this year complaining of a sore on the tip of his nose, which would not heal up.

History.—He described the condition as having started sixteen months ago, like a pimple, which broke down and discharged something. He received treatment from a dermatologist who regarded the lesion as tuberculosis of the skin.

Condition on Examination.—There was a small, crater-like ulcer on the tip of the nose which perforated into the nasal vestibule. The base of the ulcer was papilliform and the skin margin red.

There were one or two submental glands.

A portion of the ulcer was removed for microscopical examination, and was described as an epithelioma. The ulcer was removed together with a zone of apparently healthy tissue, and the submental and submaxillary regions cleared of obvious glands.

Prof. Stewart McDonald reported on April 19, 1917, as follows:

"Already reported on as squamous epithelioma."

"Four portions of the margin of incision have been examined and are all free from epitheliomatous infiltration. At one place there appears to be a distinct evidence of tuberculous deposit, and at one place in the gland there is also evidence of tuberculous deposit."

The case reminds us how readily cancer may occur in the course of a tubercular skin lesion, even at a comparatively early age, and it supports the plea for early microscopic investigation.

6. Septic Lateral Sinus Thrombosis; Operation; Recovery.

N. S.—, aged twelve, was admitted on March 8, 1917, complaining of pain in the head and left ear. The mother stated that the child began to complain a fortnight previously and after she received a blow on her ear at school. She thought the child had an ear discharge years ago, but did not seem to have noticed any recent discharge. The history was considered to be unsatisfactory.

Condition on Admission.—The child was pale, poorly nourished, and exhibited the typical adenoid facies. She was very deaf and stupid, and the functional ear examination could not be carried out satisfactorily. There was no fistula sign. There was no spontaneous nystagmus and the bone conduction indicated that there was no labyrinthine invasion. The pupils were equal, rather dilated and reacted to light. There was no objective sign of meningitis. Temperature was normal, and the pulse 100 and weak. The left external meatus contained a little foul discharge, and the tympanum was disorganised and contained foul *débris*. There was a soft fluctuating swelling over the left mastoid and extending into the temporal and occipital regions.

There was a little tenderness along upper anterior border of left sterno-mastoid, but no palpable lymph glands.

Operation was performed on day of admission. The mastoid process was exposed through the usual incision, and the swelling was found to be composed of blood-clot and blood, which had stripped up the periosteum extensively. All the cut tissue oozed stubbornly, and no single point could be identified as the cause

of the large hæmatoma, though the mastoid emissary vein was suspected.

Removal of the mastoid cortex revealed a cavity containing cholesteatoma and acute disintegrating inflammation of the bone.

The radical operation was performed, the stapes was identified, but only a small part of the malleus was found.

The lateral sinus was not exposed.

Next day, the 9th, the patient had two rigors, and her temperature rose to 102° F., and pulse 120. The left pupil was dilated, and the left optic disc was distinctly œdematous. The patient winced when the anterior margin of the left sterno-mastoid was palpated, but one could not be satisfied about the presence of glands.

A diagnosis of lateral sinus thrombosis was arrived at, and operation was carried out the same evening.

The left internal jugular vein was in the first place exposed and ligatured above the common facial.

The lateral sinus was then exposed, and a perisinus collection of pus found in relation to vertical limb. The sinus, which was full of septic clot, was traced back to within a short distance of the torcula. At this point the removal of clot was stopped as soon as first trace of blood was seen, and a gauze plug introduced lightly. The jugular bulb was not washed through.

The patient's recovery was quite uneventful. The wounds were healed and the ear dry at the end of April when she left hospital.

Remarks.—I think, from subsequent questioning of the parents, that the child had rigors at home days before her admission to hospital and nobody took any notice of it.

The emissary vein was probably ruptured by the blow and thrombosis started in the sinus, which subsequently became infected from the diseased mastoid.

The case emphasises the frequent unreliability of evidence obtained from patients or relatives as to duration of middle-ear disease, for without doubt this child must have had a stinking middle ear for a very long time.

A portion of the clot was deliberately left intact at the torcular end of the infected sinus. It was thought that this would be better than the formation of a new clot, which would very likely have involved the torcula, and which could not be expected to be sterile.

7. Temporo-sphenoidal Abscess; Operation; Recovery.

C. T——, aged thirty-seven, was admitted on May 22, 1917, on account of headache, earache, and pyrexia.

History of Illness.—Discharge from the left ear for twelve months without pain or other symptoms. A fortnight prior to admission the ear discharge stopped, the left ear became painful, and he suffered from occipital and left frontal headache. He continued to work till May 18.

On May 21 he became very drowsy and headache increased in severity. He felt sick but did not vomit.

Condition on Admission.—He had a grey or ashen appearance and his eyelids were mostly closed. His temperature was 102° F. and pulse 96. All questions had to be repeated, and his replies showed that cerebration was decidedly sluggish. Headache was his sole complaint, though deep pressure over mastoid antrum caused him to wince.

The pupils were equal and responded to light, and no change was found in discs. There was no spontaneous nystagmus. The labyrinth tests were not employed. There was no facial paresis or anæsthesia.

The patellar reflex was very slight, and there was a definite extensor toe phenomenon.

Operation.—The mastoid was exposed through usual incision, and after removal of a sclerosed cortex a good-sized cholesteatomatous mass was found occupying the antrum and neighbouring cell area.

The radical operation was performed; the stapes was intact, but a small bit of the malleus was all that remained of the other ossicles. The tegmen antri was removed and the dura in this area was found to be dull, altered in colour, and pulseless; it looked dead.

It was incised and the knife thrust into an abscess cavity which gave vent to very foul-smelling pus. The abscess cavity was probably the size of a walnut.

The opening into abscess was made adequate and a small Carrel-Dakin tube introduced, and carefully packed round with gauze introduced into the mastoid cavity.

Twenty minims of Carrel-Dakin solution was introduced every two hours. The temperature and pulse were normal the day after operation and patient felt better.

In three days the abscess cavity seemed to be clean; there was no gross pus to be seen and no smell.

The tube was removed on the fourth day and the mastoid cavity, which looked uncommonly clean, was filled with B.I.P.P.

In forty-eight hours after this patient complained of some headache and he did not look so well.

The B.I.P.P. was removed from the mastoid cavity, and a probe passed into the abscess cavity revealed a small quantity of serous-looking fluid. The cavity was mopped out and a gauze drain introduced. The headache was relieved at once.

Gauze drainage was employed for eight days, and the local and general conditions continued to improve.

Patient asked to be allowed up at end of a fortnight. He was dressed and moving about the ward at the end of *three* weeks.

June 26, 1917.—No discharge from the ear. Epithelialisation nearly complete. Patient returned to his home.

SOCIETIES' PROCEEDINGS.

ROYAL SOCIETY OF MEDICINE—OTOLOGICAL SECTION.

November 17, 1916.

H. J. MARRIAGE, *President of the Section, in the Chair.*

A Further Case of Otosclerosis associated with Otitis Media.— J. S. FRASER—(*continued*).

CASE II.

The second case is that of a stone-mason (P. B.—, aged forty-one), who fell from a scaffold on November 1, 1910, at 8.30 a.m. The depth of the fall was only 9 ft. The patient was brought to the Royal Infirmary by the police, who stated that when found the patient was conscious, but was bleeding from the right ear and complaining of pain in his right shoulder. Examination on admission showed that the face was pale and the pulse feeble, 92 per minute. There was a flow of blood and cerebro-spinal fluid from the right ear. (Microscopic examination showed fracture of the petrous bone involving the labyrinth and extending from the inner wall of the middle ear to the internal auditory meatus.) The patient was conscious but very deaf. Soon after admission coma supervened and the breathing became stertorous. A little later general convulsions came on, the eyes being turned to the right—*i. e.* conjugate deviation to the side of the labyrinth lesion. Later on squinting was noticed, the right eye looking further to the right than the left one. The right pupil was more dilated than the

left. The left side of the face and the left arm became paralysed, and the respiration was of the Cheyne-Stokes type. Pulse now 76. Operation by Mr. Cathcart 11 a.m. The right temporal region was exposed and a fissured fracture found running from the anterior part of the wound downwards and backwards. A large extradural clot was exposed by the trephine opening, but the bleeding point could not be located even when the trephine opening was enlarged. The external carotid was therefore ligatured and the bleeding stopped. A drainage tube was inserted into the operation wound in the skull. Saline was

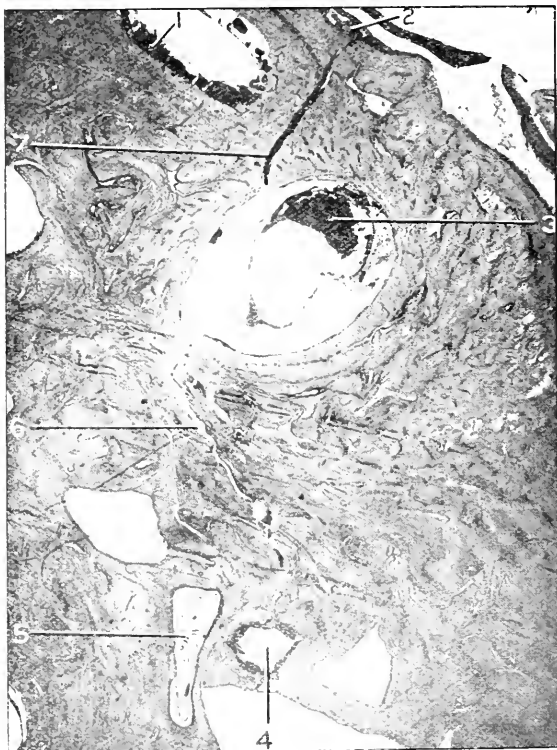


FIG. 15.—Fracture of cranial base with injury of labyrinth capsule. P. B.—, male, aged forty-one. Horizontal section through right ear. No. 1.—1. Blood in perilymph space of lateral canal; 2, 7, 6, and 4 show line of fracture. 3. Blood in ampulla of superior canal. 5. Vessels of fossa subarcuata. ($\times 12$)

injected *per rectum*. At 3 p.m. the respirations numbered 30 per minute and the pulse 128; temperature 100.6° F. The patient gradually got worse and died eight hours after operation.

Post-mortem.—Skull thicker than normal; brain oedematous; internal carotid arteries thickened. There is a considerable amount of clot behind the trephine opening and the brain has not expanded. A fissured fracture is present passing from the parietal bone to the squamous temporal and then along the roof of the tympanum. No laceration of brain. The bleeding came from the middle meningeal

artery (posterior branch). (Subsequent microscopic examination showed that the fracture must have bifurcated, one limb passing along the roof of the middle-ear cleft and the other passing inwards through the labyrinth.) In preparing the specimen for microscopic examination the outer wall of the middle ear, along with the malleus, incus, and tympanic membrane, became separated as they were already loose. Blood was present in the Eustachian tube, tympanic cavity, mastoid antrum, and cells. The line of the superior canal can be seen

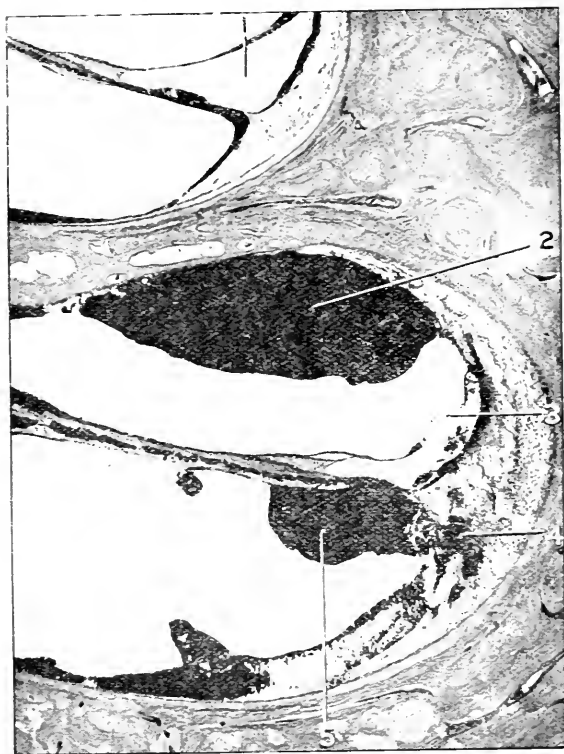


FIG. 16.—Fracture of cranial base with injury to labyrinth capsule. P. B.—, male, aged forty-one. Horizontal section through right ear. No. 78.—
1. Scala media of middle coil, with slight hæmorrhage. 2. Blood in scala vestibuli of basal coil. 3. Rupture of Reissner's membrane. 4. Blood in spiral ligament. 5. Blood below basilar membrane. ($\times 30$.)

through the bone marked out by the hæmorrhage inside. The right clavicle is fractured and there is blood behind the manubrium sterni. Both lungs showed several gummata.

Microscopic Examination of the Right Ear.

(1) As stated above the outer wall of the middle ear is absent. There is blood in many of the air cells which surround the labyrinth. On the inner wall of the tympanic cavity there is some hæmorrhage present beneath the mucosa. Hæmorrhage is also present in the niche of the round window.

(2) *Labyrinth Capsule*.—The line of fracture passes through the superior and external canal, downwards through the oval window, involving the stapes and below this through the promontory. The fracture extends inwards and reaches the internal meatus but does not extend to the dura covering the posterior surface of the petrous bone. There is no hæmorrhage along the facial nerve in the aqueduct of Fallopius, although the bony walls of the aqueduct are involved in the fracture. The posterior crus of the stapes is broken. On passing

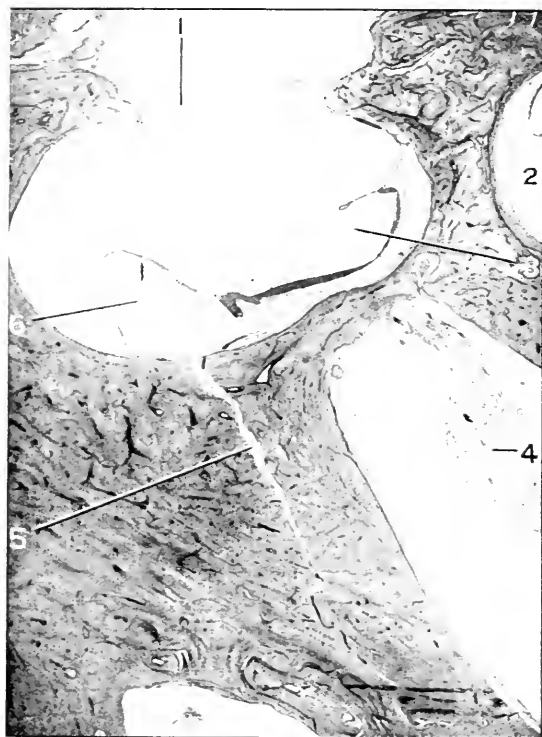


FIG. 17.—Fracture of cranial base with injury to labyrinth capsule. P. B.—, male, aged forty-one. Horizontal section through right ear. No. 125.— 1. Fracture through stapes. 2. Basal coil of cochlea. 3. Ruptured saccule with hæmorrhage. 4. Vestibular ganglion. 5. Line of fracture. 6. Ruptured utricle. ($\times 12$)

internally the line of fracture divides—one limb reaching the internal meatus and the canal for the nerve to the ampulla to the posterior canal, while the other limb stops short of the dura of the posterior fossa.

(3) *Labyrinth Contents*.—(a) *Cochlea*: There is marked hæmorrhage in the spiral ligament and in the scala tympani and vestibuli, especially in the basal coil. There is very little blood in the cochlear canal itself. In the middle coil there is no hæmorrhage except in the spiral ligament. There are a few small scattered hæmorrhages in the modiolus. The ductus perilymphaticus is free from blood. (b) *Vesti-*

bule: The utricle and saccule are ruptured and there is blood in both the peri- and endo-lymphatic spaces of the vestibule. The ductus endo-lymphaticus also contains hæmorrhage. (c) Semi-circular canal: Blood is present in the endo-lymphatic and peri-lymph spaces of the superior and external canals. The branch of the vestibular nerve to the crista of these canals shows extravasated blood. There is considerable hæmorrhage in the crus commune and in the peri- and endo-lymphatic spaces of the posterior canal.

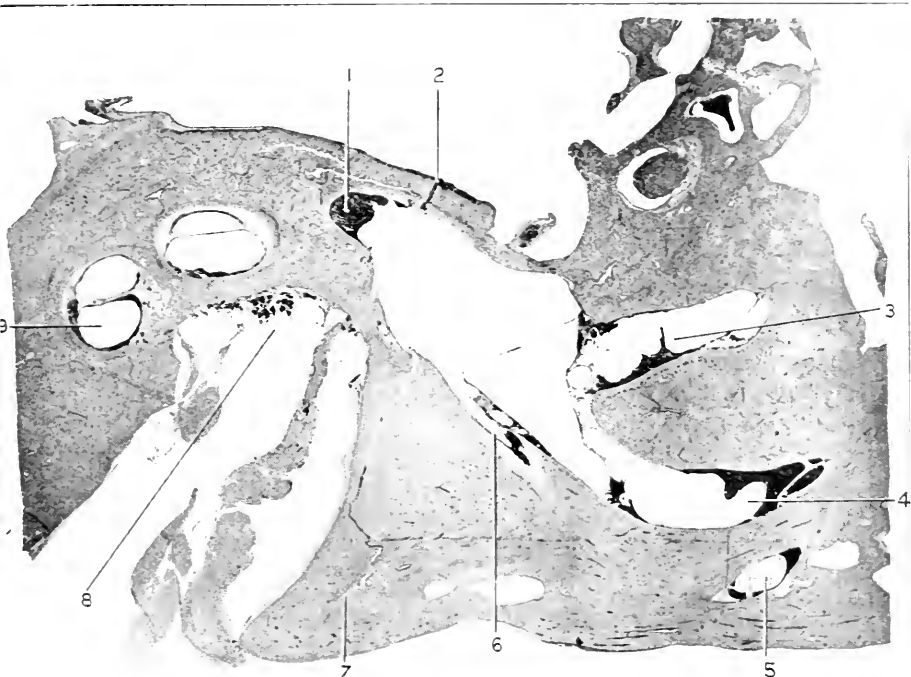


FIG. 18.—Fracture of cranial base with injury to labyrinth capsule. P. B.—, male, aged forty-one. Horizontal section through right ear. No. 175.—
1. Blood in scala vestibuli where it opens into vestibule. 2. Line of fracture.
3. Opening of smooth end of lateral canal (with hæmorrhage). 4. Opening of smooth end of posterior canal into crus commune (with hæmorrhage).
5. Blood in air cell. 6. Blood in endolymphatic aqueduct. 7. Inner end of fracture. 8. Fundus of internal meatus with hæmorrhage. 9. Basal coil of cochlea with blood in it. ($\times 8$.)

(4) *Internal Meatus and Nerves*.—There is slight hæmorrhage along the vestibular nerve, especially along the branch to the saccule. The branch of the cochlear nerve to the basal coil also shows hæmorrhage. Although the fracture reaches the fundus of the internal meatus there is comparatively little hæmorrhage present in the meatus.

The PRESIDENT: We are very much indebted to Mr. Fraser for these excellent specimens. Those showing the fractured base of the skull are particularly interesting to me. At a general hospital we are constantly seeing cases with fractured base, but usually not until some weeks after the accident, so that one cannot judge of the conditions

immediately after the fracture: when they come to us, all that can be made out is, that they have complete nerve deafness. It would be interesting to know what is the effect sooner after the accident. For a long time I have tried to get the surgeons to let me know when the patients come in, but I hardly ever have the opportunity of seeing them in a recent stage. Having seen these specimens, I shall make a further effort to see if tests cannot be carried out immediately after the accident, instead of, as at present, weeks or months afterwards, as a collection of specimens with a complete examination of the hearing would be very valuable.

(To be continued.)

OBITUARY.

MAJOR WILLIAM GUTHRIE PORTER, D.S.O., B.Sc., M.B., Ch.B.,
F.R.C.S.Ed.

It was a cause of great grief to his numerous friends when the news reached them that Major Porter (R.F.A., T.) had been killed in action on June 9 of this year, for he was a man whom all who knew him well loved because of his modesty, tact, and kindness of heart, while they admired his self-reliance and strength of character.

It is given to few to attain eminence in two professions before reaching middle age.

Major Porter was known to readers of this JOURNAL as an ardent and conscientious worker in our specialty. He was the author of an excellent work on "Diseases of the Throat, Nose, and Ear," which was published in 1912, and which showed how thoroughly conversant he was with modern oto-laryngology. In the same year he and Dr. Logan Turner brought out their work on "Skiagraphy of the Accessory Nasal Sinuses." In the revised edition of Allbutt's "System of Medicine" the article on "General Therapeutics of Diseases of the Ear" was from his pen. He also contributed valuable papers on "The Operative Treatment of Laryngeal Tumours," "Submucous Resection of the Nasal Septum," "A Fold sometimes found in front of the Posterior Nasal Opening," and "Nystagmus of the Right Vocal Cord and Soft Palate in a case of Cerebral Disease." It is thus evident that he was not only a hard worker but that he had already added contributions of great value to our literature. He was a most accurate observer and extremely careful about the verification of all his facts. In addition to this his manual dexterity was remarkable. As an operator he undoubtedly excelled, and this was partly due to the fact that he was ambidextrous—a most valuable gift for an oto-laryngologist to possess. Notwithstanding this he was rather inclined to be conservative in that he never resorted to operation until he had absolutely convinced himself that interference was essential in the best interests of the patient.

There can be little doubt that had Porter lived a few years longer in times of peace he would have taken a foremost place among the oto-laryngologists of the world. He was extremely popular both with patients, colleagues, and general practitioners on account of his charming personality, kindness, and his transparent honesty of thought and action.

Porter was not only a more than excellent specialist, but he was also



MAJOR WILLIAM GUTHRIE PORTER, D.S.O., B.Sc., M.B., CH.B.,
F.R.C.S. ED.

a very competent all-round medical man. He had held positions as House Surgeon, House Physician, and Surgical Tutor before he made up his mind to specialise. In addition he had studied on the continent with a view to general practice ere he finally determined to devote himself to oto-laryngology, so that he was always able to take a wide view as to cases which came before him. He was also a good ophthalmoscopist—a most useful accomplishment for the otologist who has to deal with endocranial disease.

At the time of his death he was Surgeon to the Eye, Ear, and Throat Infirmary (Edinburgh), to the Ear and Throat Department of the Royal Hospital for Sick Children (Edinburgh), and Aurist to the Edinburgh Royal Institute for Education of the Deaf and Dumb.

While Porter always put work before pleasure, he was extremely fond of sport. In early manhood he was prominent in football circles and played for the Edinburgh Academicals. He also saw active service in the Boer War. In later years most of the time he could give to holidays was spent with his battery of Territorial Artillery. So it came about that in 1914 he had to give up practice and devote his attention to purely military work. No doubt the mental ability which made him a successful medical man enabled him to become, after a short period of training, a very competent artillery officer. Indeed it must have been so, for at the time of his death he had not only risen to the rank of Major, but had received that coveted distinction, the D.S.O., as well as mention in dispatches.

Porter was as popular in the Army as in civil life. The writer has had the privilege of seeing letters from officers and men which fully bear out this statement, and it is just what those who knew him best would have expected: all these letters breathe a spirit of affection which it is the fortune of few men to inspire. They specially refer to his kindness of heart and courage. The former, all of us who were his friends knew: the latter, most of us suspected even before the war. Since Porter went to France we had heard from men home on leave of his doings and always we were told of his courage. Kindness and courage, modesty and self-reliance, tact and strength of character, unselfishness and yet discernment—these were the characteristics that endeared him to soldier and civilian.

While therefore we all grieved deeply when we heard that Porter had died in the service of his country on June 8, we realised that what we feared had come to pass. He had been wounded by a shell a few weeks before and had enjoyed a short leave in this country. Not many days after his return to France he fell a victim to the bullet of a sniper while making observations for the posting of his battery. Thus there has passed from among us a brilliant, many-sided personality and a gallant, upright gentleman.

“Dulce et decorum est pro patria mori.”

P. McB.

“Dr. McBride and Dr. Logan Turner¹ have paid their tributes as intimate friends and colleagues—but still as seniors—to the late Major Porter. I cannot claim to have known Porter nearly so well as Drs. McBride and Turner, but yet I feel that—as a rival—I would like to state my high opinion of his disposition, character, and ability. Porter was always a fighting man but he fought ‘fair.’

“We acted together as clinical assistants to Dr. Logan Turner in 1905-6, and it was a pleasure to see the way in which Porter went about

his work. He always did this splendidly, but, in addition, he managed to infuse into the routine work of dressing cases, removing tonsils and adenoids, and seeing out-patients a humour and jolliness which were the expression of his outlook on life. Everyone was brighter when he came and so got through the daily task with less conscious effort and probably did it better.

"When one thinks of his personality, his energy, his ability, and his exuberant good health, it brings home the wastefulness of war which leaves those who are so much less fit to continue the struggle of everyday life. Still such a war as is now being waged demands the best a nation can produce, and Major Porter was undoubtedly one of these."

J. S. F.

VICTOR DELSAUX (Brussels),

Born 1861. Died 1917.

AMONGST the wholesale horrors of the present war, although

"Each new morn,
New widows howl; new orphans cry; new sorrows
Strike heaven on the face,"

yet single instances of misery sometimes bring home to us even more acutely the "weight of this sad time." The death of Jules Broeckaert amongst us in London, an exile from his native land, and now the death of Victor Delsaux, a prisoner in his own beloved country, fill us, as Prof. Tapia says in the *Revista Española de Laringología*, with "una impresión de imborrable tristeza." They were not only leading men in Ghent and Bruxelles, but were both such distinguished laryngologists and had contributed such valuable work in advancing our speciality, that their names were well known to every laryngologist in the world.

Victor Delsaux was born in 1861 and spent his childhood in his native town of Fleurus. He went to school at Dinant, little dreaming of the days when this picturesque city on the Meuse would be ruined by the brutalities of war. Entering the University of Bruxelles in 1879 he devoted his first two years to the study of natural sciences. After qualifying, he passed a year in the best known clinics in Paris, and settled down to a family practice amongst the poor of Bruxelles. Whilst thus engaged he obtained the post of assistant with Profs. Capart and Delstanche père, perfecting himself in oto-rhino-laryngology and gradually withdrawing himself from general practice.

About this time he showed his cosmopolitan tastes for travel and culture, visiting London, Petrograd, Moscow, Zurich, Berne, Geneva, the chief Italian cities, and the Scandinavian and neighbouring German countries. He went still further, visiting the Island of Madeira, where he did not forget to inspect and study its leper hospitals, and touring in Morocco where he did not omit to see its hospitals and gaols. During these travels, as later on, he formed a large circle of acquaintances with colleagues, clinics and learned societies, and from each journey he brought back observations which widened his views and deepened his sympathies, as well as books which he was continually adding to his cherished library. For he was a great reader, and owing to his linguistic talents he was able to devote himself to the medical literature of half a dozen languages.

Working so long as "médecin-adjoint" at the hospital and

university work of Prof. Delstanche, it is not surprising that on the latter's death in 1900, Delsaux should be promoted to follow him as Chef de Clinique at the Hôpital St. Jean. At this time Delsaux was forty years of age, and he then started on the full and vigorous career for which he had so carefully trained himself. Not only did he lecture to students, manage a large clinic, and build up a large private practice, but he devoted attention to such things as photography, electricity, radio-therapy, the spreading of antiseptic surgery, and the diffusion of fresh-air principles, but in all these directions he gave a full measure of prodigious energy and rare talent.

He founded the *Presse Oto-Rhino-Laryngologique Belge*, and remained its editor until the red ruin of war arrested the progress of science and substituted an empire of barbarism. This journal soon obtained a high scientific reputation among the researchers and literary men of all countries. His own contributions to it were considerable and made him a well-known international figure, still further increased by his travels and investigations in France, Algiers, the Netherlands, Switzerland, Spain, Canada, and the United States.

Many of us had the opportunity of being further attracted by his charming personality when we travelled on the same ship with him to Quebec to attend the Toronto meeting of the British Medical Association in 1906, under the presidency of Dr. Dundas Grant. And we also had the pleasure of welcoming him at the Belfast meeting of the Association in 1909, when he read an interesting paper on "Laryngostomy."

Delsaux had an international spirit, but it was of the sincere and generous type. Like all wise travellers, he did not go abroad to think less of his native land, but to return to it a still truer and more enthusiastic patriot, only anxious that it should advance along any of the paths of progress he had spied out during his travels. Thus he was among the first to start in Bruxelles a private nursing home, founded on what he had seen here and in the private hospitals of America. He was a keen supporter of the Touring Club de Belgique, a patriotic and philanthropic association for which we have no analogy in this country. Its object is to improve the facilities and conveniences of travel in Belgium, and to make them appeal more to the appreciation of foreigners. In the *Bulletin* of the Club one can find many of Delsaux's articles written about places of interest, mines, industrial establishments, and so forth. The vein of humour, wit, and vigour running through them recalls his own charming and vivacious conversation. Another work making for international understanding at which he toiled was an effort to index and number the medical publications of all countries and give them in a paper called the *Office International de Bibliographie*, established in Bruxelles. When one recalls that the *Presse Oto-Rhino-Laryngologique Belge*, carefully edited, came out monthly and punctually, that he had all the manifold interests I have mentioned, and that he was such a far traveller, it is astonishing that he still found time to keep his friendships in repair. Yet there was no more sociable man in Europe, amongst high or low, rich or poor, than the large-hearted and generous Victor Delsaux. The Italians would have called him a "buonaccione," a term which is not altogether well translated by "a jolly good fellow," and the little children of the poor at the Hôpital St. Jean always referred to him as their "cher gros docteur." For children he always had an affection, and even when his country was in the hands of the Bosches he worked hard at establishing and managing a "mother's canteen" where more than 12,000

destitute children have been saved from perishing in Bruxelles from want of food.

Delsaux had no national prejudices, and was welcome, and made himself welcome in every country he visited. Naturally enough, the affinity of language attracted him to France, where many of us have met him at the annual gatherings of the *Société Française d'Otolaryngologie*. Just before the war he was engaged, in collaboration with Lermoyez, of Paris, and Moure, of Bordeaux, in producing a monumental work on otology and laryngology. I do not know whether his part has been completed, but I hear that his heroic and strenuous character is proved by the fact that, even during the last year, although a prisoner in his own country, he had been able to complete an important "*Traité de Laryngologie Pratique*."

His affection for England, her ways, and her people is best proved by recalling that outside of Bruxelles, in the Valley of Epinette, on the borders of the lovely forest of Soignes and not very far from the historic field of Waterloo, he had built a country house, which was not only modelled on the style of the timbered cottages of England, but to it he had given the English name of "Firwood." Here the friends of all countries who visited Bruxelles, or attended its scientific gatherings, were always welcome. They were sure of charming hospitality either at Firwood or in the various restaurants which he knew so well in the neighbourhood of the Grande Place. Not that Delsaux was either a *gourmand* or *gourmet*, but he was what the Germans call a "*Feinschmecker*," and showed his taste in his entertainments as he did in his appreciation of literature, art, music, or travel.

Last winter he was stricken with appendicitis on January 25. He died on February 3, and was followed to his grave by a crowd of mourners on a day of freezing cold, and with the German flag flying over Brussels in a bitter wind.

He lies in the cemetery of Ixelles alongside of his wife, whom he lost in 1891, after a short two years of wedded life. For her memory he always retained a touching devotion.

It is heartrending to think that Belgium, brutally beaten down by "military necessity," should have lost in Delsaux such a gallant son. But it is not only Belgium, it is the science and humanity of the civilised world which share in this loss. Some of us will look forward sadly to visiting that cemetery at Ixelles, when the German flag no longer waves over Belgium.

STCLAIR THOMSON.

Abstracts.

LARYNX.

Heart Failure during an Operation for the Removal of Tonsils and Adenoids: Heart Massage through an Abdominal Incision; Recovery.—Mollinson, W. M. "Proceedings of Royal Society of Medicine, Section of Anæsthetics," December, 1916, p. 1.

The patient was a boy, aged six. A mixture of chloroform (two parts) and ether (three parts) was administered on an open mask; without any struggling the boy became unconscious, but the corneal reflex was never lost.

The left tonsil was removed successfully: while the right was being removed the boy struggled slightly. It was noted that he did not struggle while the adenoids were curetted, and he remained inert when cold water was poured over the face.

On examination the boy was found to be flaccid, respiration had ceased, the pupil was dilated, and the corneal reflex absent. Examination with a stethoscope revealed absence of heart sounds.

It was now decided to open the abdomen and massage the heart. With the left hand on the chest wall and the fingers of the right hand behind the heart pressure was exerted at about the rate of ninety times a minute: for some moments there was no response, then some respiratory movements began and continued intermittently: still there was no attempt at heart contractions.

Massage was maintained, and after about twenty more squeezes the heart suddenly began beating strongly.

From such time records as it was possible to keep, it is fairly certain that the time during which the heart was stopped cannot have been less than thirteen minutes and not more than twenty-four minutes. During part of this time, however, some slight circulation must have been going on because it was noticed that respiratory movements started while the heart was being massaged.

For seven days the boy was more or less unconscious: consciousness then gradually returned (with relapses). For ten days there was rigidity of the limbs, or choreic movements—at one time both feet and hands were held in the position of tetany. For four days he frequently cried out shrilly meningitic cry, for thirty-six hours the screaming was almost continuous. Shortly expressed he had symptoms of severe cerebral irritation, no doubt due to the damage done to the brain during the cessation of the circulation. He made eventually a perfect recovery.

Archer Ryland.

Aphonics during the War. Our Treatment by Re-education.—G. Liébault and E. Coissard. "Rev. de Laryngol., d'Otol., et de Rhinol." February, 1917.

Most of the patients who lose their voices from neuropathic causes in the war have no disability of these muscles of the lips, tongue, or palate. But there exists another class of case where these muscles are affected by a functional paresis. In such patients the above muscles may display inco-ordinate and bizarre movements. And—a point to be emphasised in reviewing the authors' report—the movements of the diaphragm are jerky, and the thoracic expansion and capacity subnormal.

After these introductory remarks a schedule of exercises follows, such as protrusion and retraction of the tongue, pouting of the lips, and so on. The movements should be practised before a mirror. As soon as co-ordinated movements have been reacquired, the projection of the voice into the upper resonance cavities may be cultivated.

The authors next proceed to give striking curves, plotted on charts, of the results of treatment: these show a notable parallelism between the increase in respiratory expansion, thoracimetry, and voice-power. Moreover, any of their pupils who, having re-attained speech, subsequently lose it momentarily (without any inflammatory cause), show a simultaneous temporary reduction in respiratory capacity as obtained by thoracimetry. Any soldier who has remained aphonic for two weeks without signs of acute laryngitis, should at once be sent to a phonetic re-education establishment. At present they are found, on search, at

depôts, convalescent hospitals, and even temporarily discharged for "chronic laryngitis." (This last is not necessarily, as it might seem, a mistaken diagnosis. I have repeatedly noticed that men who can only whisper, through inability to adduct due to shell-shock, do, after about ten days, develop a subacute or even chronic laryngitis as the result of trying to speak aloud. These would justifiably be diagnosed as the authors suggest. Abstract.)

Among seven cases described *in extenso*, it is noteworthy that one patient, treated elsewhere for chronic laryngitis for several months, recovered, after orthophonic re-education, in a few weeks.

The authors submit that no case, however long neglected, is hopeless; but that *timely* treatment is the keynote of success.

This paper has an undoubted military value. *H. Lawson Whale.*

NOSE.

Non-operative Treatment of the Accessory Sinuses.—L. A. Coffin. "Laryngoscope," 1915, December, p. 833.

Coffin states that he has ceased to think of the cure of disease of the accessory cavities whether operation is performed or not. He is satisfied he can arrest the trouble. He finds that most radical operations have been followed by recurrence, while a sinus once diseased seems more liable to reinfection. Coffin advocates the employment of negative pressure in conjunction with autogenous vaccines. After the vacuum has been produced he forces medicated air into the nose and accessory sinuses by means of a special apparatus attached to the vacuum instrument. The apparatus consists of a connecting tube ending in an olivary nozzle. To this connecting tube two bottles are attached (1) the vacuum bottle and (2) the medicating bottle. The physician can either apply suction by means of a vacuum pump and bottle (1), or he can shut off the vacuum and force in medicated air through bottle (2) by using a force pump. Coffin gives a history of five illustrative cases. *J. S. Fraser.*

Isolated Nasal Diphtheria.—J. D. Rolleston. "Brit. Journ. Child. Dis.," vol. xiv, p. 21.

An instructive and exhaustive paper, giving bibliography and then proceeding to fifty-five cases occurring at the Grove Hospital, Tooting, between 1902 and 1915. With the exception of two patients (aged twenty-six and fifty-one), the disease was confined to children of from five weeks to sixteen years, and preponderates during the cold months of the year. The author summarises thus: (1) Isolated nasal diphtheria, *i.e.* diphtheria originating in and confined to the nose, occurred in ninety-five out of 3000 cases of diphtheria (1.5 per cent.) admitted to hospital. (2) It is most frequent in young children and in the cold months of the year. Congenital syphilis is a predisposing cause. (3) The great majority of cases run a mild course, but rare examples of toxæmic diphtheria confined to the nose undoubtedly do occur. (4) The habitually mild course of isolated nasal diphtheria has been proved to be due to auto-immunisation. (5) Chronicity is a characteristic feature of isolated nasal diphtheria, the persistence of the bacilli being explained on anatomical grounds. (6) Sequelæ occasionally occur, but are rare. (7) Treatment by antitoxin is indicated (this is contrary to the declaration of StClair Thomson that antitoxin is useless in these cases).

Local treatment should be avoided (owing to risk of infecting the middle ear). (8) The term "fibrinous rhinitis" should be reserved for those comparatively rare cases in which this form of rhinitis is due to other causes than the diphtheria bacillus (such causes being staphylococcus, streptococcus, and pneumococcus). (9) The practical significance of isolated nasal diphtheria consists in its epidemiological importance.

Macleod Yearsley.

ŒSOPHAGUS.

Post-typhoid Ulceration and Stricture of the Œsophagus.—R. K. Moorhead. "The Laryngoscope," December, 1915, p. 848.

Moorhead begins with a review of the literature. No case of typhoid ulceration with perforation of the œsophagus has so far been found at *post-mortem*. Most of the patients have first noticed difficulty in swallowing during convalescence though dysphagia during the disease itself may be produced by ulceration of the pharynx or larynx. Only seventeen cases of post-typhoid stricture are on record, and in only two of these was there a stricture in the upper part of the gullet. Moorhead's patient was a man, aged twenty, who suffered from a typical attack of typhoid in February, 1914. At the end of the fourth week he noticed difficulty in swallowing soft toast. By the middle of April he could take no solids whatever, and in June a radiogram showed a tight stricture at the level of the eighth dorsal vertebra with a large dilatation above. Direct examination showed a tight stricture which only admitted a probe with difficulty. In three weeks the stricture was dilated sufficiently to permit the introduction of a Lerche dilator, after which it rapidly expanded to normal size. Four months later he was able to swallow any kind of food, but occasionally noticed slight hesitation due to the fact that the dilated upper portion of the œsophagus had not got the ordinary propelling power. Moorhead gives short extracts of seventeen cases by other writers. In this series gastrostomy was performed upon six patients, while eight were dilated with bougies (one death). Three other patients died without either operation or dilatation. Practically all occurred before the days of œsophagoscopy.

J. S. Fraser.

EAR.

The Treatment of the Deafness in Chronic Catarrh of the Middle-Ear.—Sophus Bentzen. "Nord. Tidskr. f. Oto. Rhino. Laryng.," Bd. 1, nos. 2, 3, and 4, p. 175.

The novelty recommended by the author is vibratory massage of the external meatus under negative atmospheric pressure, for which a special apparatus is required.

Dan McKenzie.

The Labyrinth Operation.—Edward B. Dench. "The Laryngoscope," August, 1915, p. 556.

Dench gives it as his opinion that during the past few years the labyrinth operation has been less frequently undertaken than formerly. From 1904 to 1915 the cases of acute purulent otitis media treated at the New York Eye and Ear Infirmary numbered 17,726, while the chronic cases numbered 18,859, and the acute catarrhal cases 9613, giving a total of 45,998. During this period 45 operations on the labyrinth were

performed, or less than one-tenth of 1 per cent. Dench's own records during the same period show 659 cases of acute and secondary mastoiditis, 533 of chronic middle-ear suppuration subjected to the radical operation, 23 cases of brain abscess, 39 of meningitis, and 37 of sinus thrombosis. From 1907 to the end of 1914 Dench has operated on 22 labyrinths, so that in all cases of middle-ear suppuration the labyrinth operation was performed in only 2 per cent. Of the 22 cases the labyrinth operation was partial in 10 and complete in 12. Of the former 7 were cured and 3 died (2 from meningitis), and of the latter 7 were cured and 5 died (in 2 of these meningitis was already present before operation). Dench believes that, given a dead labyrinth, in a case of acute suppurative otitis media, where no labyrinthine symptoms are present, *i. e.* no disturbance of equilibrium, no fever, and no signs of meningitis, it is unwise to do a complete labyrinth operation. Such patients should be carefully watched as regards temperature, vertigo, nystagmus, and headache. If these symptoms arise the complete labyrinth operation should be at once performed. In three of Dench's cases, where this plan was followed, the patients made a complete recovery. According to the statistics of the New York Eye and Ear Infirmary, labyrinthine involvement in acute or chronic middle-ear suppuration occurs even less frequently than brain abscess or meningitis. In none of Dench's cases of cerebellar abscess was this condition secondary to labyrinthitis, though many of his meningitis cases were due to labyrinthine involvement.

J. S. Fraser.

Massage of the Eustachian Tube.—Andrew Lewy. "Annals of Otology," xxv, 898.

The method is one described originally by Mink. A nasal applicator is curved to about the same degree as an Eustachian catheter, but a shorter segment of the curve is used. A number of different lengths of curve are necessary to fit septal deviations and various anatomical conditions. The cotton is wound so as to form a thick ball. The region of the tube-mouth is cocaineised and the cotton armed applicator is passed back to the posterior pharyngeal wall, swept upward in the fossa of Rosemüller, brought forward over the mouth of the tube and immediately downward and back under the mouth of the tube. The motion is repeated about twenty times. Several cases are reported, with the usual marked improvement, except to tinnitus. As usual, also, it is noteworthy that other methods (*as inflation*) are used in conjunction.

Macleod Yearsley.

The Radical Mastoid Operation.—Thos. J. Harris.—"Annals of Otology," xxv., 835.

From a review, historical and personal, of the radical mastoid operation, Harris concludes: (1) That it is an operation of undoubted merit. (2) That it has been in the past and is to-day being performed often when not called for. (3) That the results are by no means uniformly good, partial or complete failures occurring in a considerable percentage of cases. (4) That improvement in hearing cannot be promised. The most that can be offered is that the hearing will not be altered; but there is sufficient risk of lowering or destroying it to warrant reluctance or refusal to operate in case the hearing in the other ear is destroyed. (5) That while accidents are met with in the course of the operation they are not of sufficient frequency or significance to have any bearing on a decision in regard to operation.

Macleod Yearsley.

MISCELLANEOUS.

Anatomic Relations of the Cavernous Sinus to other Structures, with Consideration of Various Pathologic Processes by which it may become involved.—Langworthy, H. G. "Annals of Otology, etc.," xxv, 554.

Presents a fairly clear picture of its subject and indexes the scattered data of pathological affections available in the literature of the past fifteen years.

Macleod Yearsley.

Epidemic Cerebro-spinal Meningitis. Craniotomy.—Nils Arnoldson. "Nord. Tids. f. Oto-Rhino-Laryngologi." Bd. 1, nos. 2, 3, and 4, p. 149.

Two cases reported: (1) Man, aged twenty. Very acute case with loss of consciousness on the first day of the disease. The posterior cranial fossa was opened and the lateral cisterna at the angle of the pons drained. Six hours later consciousness was regained, but, in spite of free administration of "serum" both intra-cranially through the cranial wound and intra-spinally, the case ended fatally.

(2) Woman, aged twenty-eight. Illness lasted about a month. Lumbar puncture and intra-spinal injections of serum repeatedly performed. Craniotomy and drainage as above, but without any evacuation of fluid from the cisterna. Death.

Don McKenzie.

Further Observations on the Relation of Autointoxications to Acute Membrane Disturbances.—Sargent F. Snow. "Annals of Otology," xxv, 972

The author has already written six papers on this important subject, and in the present (seventh) one draws conclusions from a twenty-five years' practice. He points out that his views are largely personal and not authoritative, but that they help to clarify the situation as to the fundamental principles involved in handling common colds and allied inflammations of the accessory sinuses, ear, mastoid, pharynx, and larynx. Whilst a balance is kept between the inhibitory intestinal juices of the upper bowel and the bacteria of the lower bowel, there is no need for common membrane congestions. Autointoxication means self-poisoning from bacteria originating within the body, which may be active ("bilious attacks") or passive. Overeating and constipation lead to these conditions. In such cases the author believes in calomel, 2 to 4 gr., in $\frac{1}{4}$ gr. doses.

Macleod Yearsley.

Epidemic Meningitis: On the Presence of an Accessory Food Factor in the Nasal Secretion.—C. Shearer. "Lancet," 1917, i, p. 59.

The author discusses the action of this accessory food factor on the growth of the meningococcus and other pathogenic bacteria. In this preliminary communication he concludes from experiment that there is in the nasal secretion some body which greatly accelerates the growth of the meningococcus on an artificial culture medium. Alone it is incapable of acting as a food or stimulant to the growth of this germ. It is soluble in water, less so in alcohol, and very insoluble in ether. It has great heat-resisting power, being able to resist prolonged boiling for many hours. It is not destroyed by boiling in the presence of strong hydrochloric acid for twelve hours. In addition to the meningococcus it also stimulates the growth of many other pathogenic germs.

Macleod Yearsley.

NOTES AND QUERIES.

A FUNCTION OF THE TONSILS.

Bacteria in the blood are derived from various sources. Eccles, in commenting on the power of the body cells to resist bacterial invasion, calls attention to the fact that such resistance is a response to the action of bacteria that are early introduced into the blood stream, and that an early introduction of bacteria, such as occurs in some instances through the tonsils, is essential to the development of this defence. If this is true the tonsils and kindred organs may on occasion assume the rôle of immunisers, permitting just a sufficient number of bacteria to enter the circulation at an early stage of the infection to develop resistance to the specific organism.—W. J. MAYO (Rochester), *The Lancet*, November 25, 1916.

EDINBURGH SCHEME FOR DEAF SOLDIERS.

Hitherto the cause of the soldier deafened in his country's service has scarcely received the sympathy and public attention which it deserves. In this matter Scotland has given a lead. The Edinburgh Lip-Reading Association, finding that little was being done for the thousand soldiers discharged up to a year ago with damaged powers of hearing, took up the matter and raised funds. The Edinburgh School Board agreed to supply class-rooms and teachers, while the association undertook the care of the men during their period of training. The first session of six weeks' instruction organised by the association lately came to a close, when the class was inspected by the Marquis of Graham. It is to be hoped that this valuable work will be undertaken in other centres without delay, so that the deaf soldier may no longer feel that he is "nobody's child."—*Brit. Med. Journ.*, June 16, 1917.

TRAINING OF DEAF DISCHARGED SOLDIERS.

Sir A. Griffith Boscawen, replying to Mr. Holmes, said:—The Statutory Committee have made thorough inquiries into the best methods of treating and training the deaf, and, with the assistance of the Board of Education in England and of the Education Offices in Scotland and Ireland, are arranging for the establishment of centres of instruction in lip-reading. Very few deaf disabled men have, however, applied for instruction or have accepted it when offered, and it is now proposed to establish a special aural board, who will get into touch with the men at the time of discharge or renewal of pension, with a view to their advising and getting the men to take the treatment or training most suitable for them.—*The Times*, Tuesday, July 3, 1917.

MEDICAL SOCIETY OF LONDON.

We note with satisfaction that our *confère* Sir StClair Thomson has been elected President of the Medical Society of London for the Session commencing in October next.

On looking back through the list of presidents since its foundation in 1773 we see that the presidency has never before been awarded to one of our specialists, with the exception of the year 1894, when Sir William Dalby occupied the chair. It also appears to have been once filled by an ophthalmologist, viz. Mr. Brudenell Carter in 1886.

Mr. Charles J. Heath, F.R.C.S., has been appointed Consulting Aurist to the Metropolitan Asylums Board Infirmary for Children, London, W. 1.

BOOK RECEIVED.

Contribución a la Cirugía de la Hipofisis By Dr. E. V. Segura, Buenos Ayres, 1916.

THE
JOURNAL OF LARYNGOLOGY,
RHINOLOGY AND OTOTOLOGY.

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AN AIR RAID CASE.

BY MACLEOD YEARSLEY, F.R.C.S.,

Otolologist to the London County Council Deaf Schools; late Senior Surgeon to the Royal Ear Hospital, etc.

A LARGE number of cases illustrating the effects of modern high explosives upon the organ of hearing are being collected from the Front and present features varying from shock to permanent injury. In most cases the part affected is the labyrinth and those in whom deafness has been due to middle-ear conditions may be accounted lucky. Such a case is the following, who, although she was not injured at the Front, suffered nevertheless in the service of her country.

Miss X——, aged twenty-seven, was sent to me in June, 1917, by Dr. Jessie Campbell. She was a teacher at a school in the east of London. Eight days earlier, during the air raid of June 13, she was standing by the front door of the school, superintending the passing of her class to the basement, when a bomb was dropped some yards away in the street. The door was burst open by the explosion and she was thrown down, sustaining a scalp wound. She did not lose consciousness, but found that she was markedly deaf, especially in the left ear, with loud ringing tinnitus. The latter was much improved by the next day, but the deafness was diminished but very little. She experienced great difficulty in distinguishing low tones and distant sounds. There was no vertigo.

On examination, she stated that the tinnitus was now only just noticeable. The right tympanic membrane was markedly indrawn. The left tympanic membrane was very markedly indrawn, and its superior posterior quadrant appeared at first sight to be perforated, the long process of the incus standing out and the fossa rotundum being plainly indicated. The Peter's pneumatic speculum, however, showed movement over the apparent perforation, suggesting the presence of a strongly indrawn flaccid posterior segment. The handle of the malleus moved freely.

There was nothing noteworthy in nose, throat, or nasopharynx.

The functional tests gave the following reactions: Weber's test showed no reference to either side. Rinne was just positive to the

C 128 fork on both sides. Bone conduction to the 35 sec. fork was right 36", left 40". The hearing for low tones was right: 2 C 32, left: 1 C 64, that for high tones (taken with the Edelmann-Galton whistle) was over 15,000 double vibrations on both sides. The whisper hearing was right: 7 ft., left: 25 in.

The case appeared to be one of acute depression of the tympanic membranes from sudden increase of external pressure. The appearances of the membranes varied remarkably. The right was markedly indrawn, but its texture was slightly thickened. The left looked as if a very flaccid posterior segment were lying in the internal tympanic wall; it was the left ear which was towards the explosion. The functional tests indicated a middle-ear condition (by increased bone conduction and loss of low tones), but not a very marked or long standing one (Rinne reaction still positive, bone conduction only very slightly increased), and no implication of the labyrinth.

On using the Eustachian catheter, there was no perforation sound in the left ear and the appearances noted in the tympanic membrane before inflation were less marked—"blurred" is the word which best describes them. The hearing for the whisper after catheterisation was right 15 ft., left 8 ft.

I saw her again on July 12. The hearing was much better and the tinnitus was reduced to an occasional slight ringing, especially on lying down. The appearance in the left ear was the same. The hearing for the whisper was 15 ft. for both ears, and the Rinne reaction was more markedly positive on the two sides. The Eustachian catheter again failed to elicit any perforation sound.

It would be interesting to know the proportion of pure middle-ear cases, such as this, to labyrinthine concussion after exposure to high explosives. I have seen two similar cases in officers from the Front and I have heard of others, but one is inclined to consider that their occurrence without any sign of labyrinthine involvement, would be distinctly rare.

SOME CASES OF FACIAL DEFORMITY TREATED IN THE DEPARTMENT OF PLASTIC SURGERY AT THE CAMBRIDGE HOSPITAL, ALDERSHOT.¹

BY CAPT. H. D. GILLIES.

CASE 1.—*Formation of the Upper Half of the Bridge of the Nose* (*vide* Photos 1 and 1A).—The loss of tissue comprised:

- (1) The nasal bones, underlying portion of septum, frontal spine, and upper portions of nasal process of superior maxillæ.
- (2) The skin that should cover this part of the nose.
- (3) The right eye.

There was a small opening into the nose surrounded by scar-tissue and granulations, which, when excised, left a bare area of about $\frac{1}{2}$ in. square.

First Operation (June 4, 1916).—Excision of scar, and submucous resection of a piece of the perpendicular plate of the ethmoid, which was swung forward to form a bridge, and sutured below to the septum

¹ From *St. Bartholomew's Hospital Journal*.

of the lower nose with catgut. Two sliding lateral flaps from the cheek were cut, undermined, and sutured over this bridge with fine interrupted silk (*vide* Figs. 1 and 2).

Result.—Slight breaking down near the angle of the right eye, which socket was not entirely clean. Primary healing of the rest, with excellent cosmetic results. As anticipated, the bridge gradually sank, as the bridge of cartilage was not strong enough to support the contracting skin flaps.

Second Operation (September 3, 1916).—Gas and oxygen anæsthesia by Capt. H. E. G. Boyle, who, on a visit, kindly gave a very satisfactory demonstration of this method.

Small skin incision; skin very carefully undermined from below upwards, and when the frontal bone was reached the depth was increased, and the periosteum incised and raised. A piece of rib cartilage of the necessary length was cut and fashioned, and then

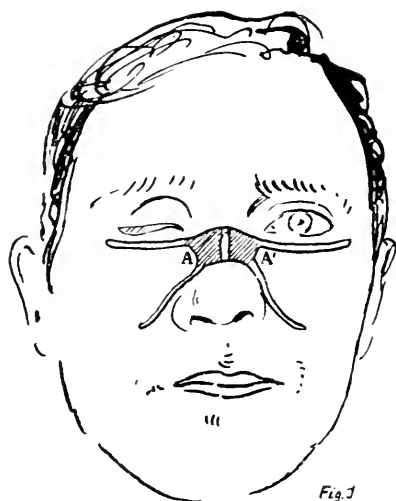


Fig. 1

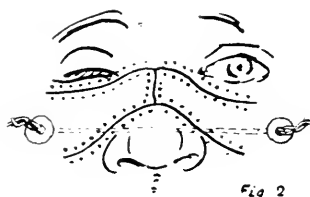


Fig. 2

Note: Wire retention sutures.

CASE 1.

inserted under the skin and periosteum, and its lower end made to rest on the cartilage of the lower part of the septum. Catgut ligatures were inserted to hold it central, but, as the photos taken two months after show, this end slipped off the cartilage and produced a slight deformity.

With the fitting of an artificial eye the result was very satisfactory (*vide* Photos 2 and 2A).

CASE 2.—Temporal Muscle Transplantation for Deformities caused by Loss of the Malar Bone.—These cases show a distressing and very depressed scar, which can be remedied by the following means: fat graft, cartilage graft, or by foreign body, such as celluloid or wax.

Fat grafts are, in my experience, a little uncertain. When primary union has occurred aseptic fat necrosis often sets in about the tenth day. Moreover, as this wound is nearly always connected with a



PHOTO 1. Case 1. Pte. S—.

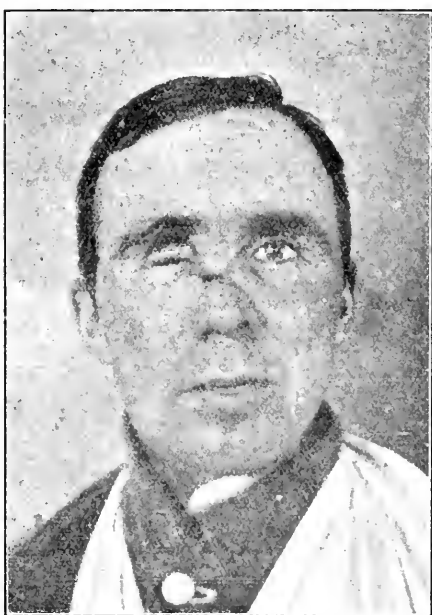


PHOTO 1A. Case 1. Pte. S —.



PHOTO 2. Case 1. Pte. S—.

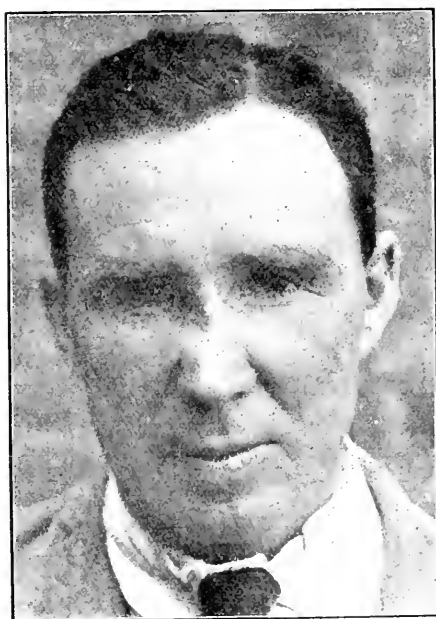
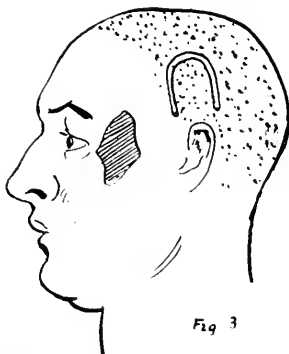


PHOTO 2A. Case 1. Pte. S—. (Cartilage graft of nose.)

discharging eye-socket, the free graft (fat or cartilage) is liable to become infected.

I tried celluloid plates but found them unsatisfactory.



CASE 2.



PHOTO 3. Case 2. Pte. F——. Loss of malar.

I have used the temporal muscle flap in a good many cases to date, and have had uniformly good results. The incision in my later cases is in the hairy scalp, and overcomes the disadvantage of producing a scar across the temporal region, where the skin does not heal usually without marked scarring.



PHOTO 4. Case 2. Pte F——. Temporal muscle transplant.



PHOTO 5. Case 2 Pte. F——. Later.

Fig. 3 shows the U-shaped incision in the scalp to expose the temporal muscle. The anterior third or two-thirds of the fleshy origin of the temporal muscle is elevated from the bone, passed under the bridge of skin, and sutured to the deep tissues below the eye, or wherever it is needed to make up the contour.

When freeing the muscle it is necessary to separate the anterior portion from the part left behind, either with the knife or scissors, starting from above, and working down towards the insertion of the fibres into the mandible. The attachment to the zygoma and the temporal fascia must also be severed before the flap will come forward easily.

The blood and nerve supply is not apparently seriously interfered with, for in the majority of cases the transplanted muscle can be made



Fig. 4

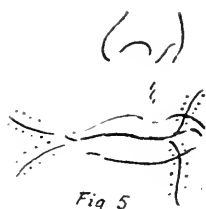


Fig. 5

CASE 3.

to contract, and gives a very colourable imitation of the action of the orbicularis oculi, which is usually paralysed from the associated upper facial paralysis.

No inconveniences in mastication appear to result, and the hollow temporal region makes the new zygoma more prominent. The method is variable within limits as to the amount of muscle taken, and as to the positions into which it may be swung. Drainage for the hollow produced by the transplantation is always necessary.

Photos 3, 4, and 5 illustrate an actual case treated by this method.

CASE 3.—*Formation of New Corners to the Mouth, together with the Repair of the Adjacent Portions of Lips and Cheek; Fracture of the Jaw.*—Date of wound, July 1, 1916; stated to be machine-gun bullet. Photo 6 shows the condition of Private D— on admission two days after being wounded. The X rays showed fracture of the mandible in

two places—in the region of the first molar tooth, and in the region of the symphysis, the intermediate portion of bone being displaced.

Plastic Operation (September 11, 1916).—This operation consisted in excision of scars on both sides.

On the right side the two surfaces of the cheek were merely drawn together, and the mucous membrane from inside the mouth brought out to form a new angle.

On the left side a combined skin and mucous membrane flap was swung towards the oral opening both in the upper and lower lips (*vide* Figs. 4 and 5).

The result of this operation was satisfactory, except that the movement of the lower jaw began to stretch the line of union of the flaps on



Fig. 6

the right side of the cheek, and the wound partially broke down near the corners of the mouth. It was limited by immediately fitting a closely applied chin splint and attaching it over the head. Since then, in all cases in this region I have been careful to support the lower jaw until the operation wound is well healed.

Second Plastic Operation (October 31, 1916).—Scar re-excised, and in order to raise the corner of the mouth a little, a flap was outlined as per diagram (Fig. 6) and sutured to the lower lip.



Fig. 7



Fig. 8

Third Plastic Operation (January 1, 1917).—A portion of the right scar having again broken down, it was re-excised, the knife being used obliquely to the skin surface. Local fat flaps were turned in from above and below the depression, sutured together with catgut, and the skin sewn over this pad with fine interrupted horse-hair. A small mucous membrane correction was made on the left upper lip, and the left lower lip was raised at the corner by a horizontal incision through the whole thickness of the lip being sewn up perpendicularly (Figs 7 and 8).

Photos 6, 7, and 8 show the condition before and after treatment, and the stage after the first operation.

Firm bony union of the lower jaw has occurred, and the patient can eat solid food. Further improvement could be effected by bringing down the upper lip at the left angle, but as, functionally, the man is fit



PHOTO 6. Case 3. Pte. D—. On admission.

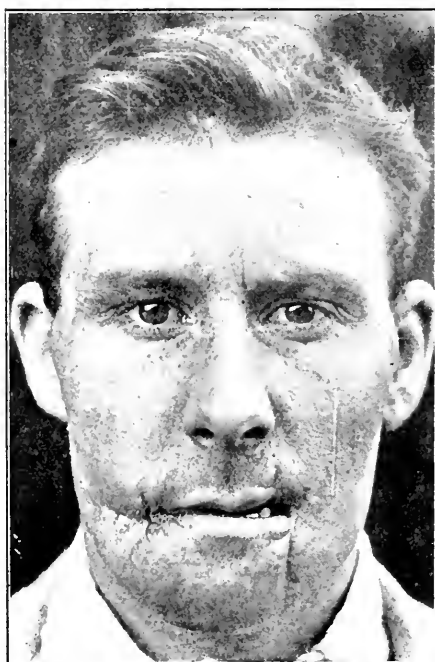


PHOTO 7. Case 3. Pte. D—. Result first plastic.



PHOTO S. Case 3. Pte. D——. Final.

to serve again, he has been sent back to duty. The dental work was carried out by Capt. F. E. Sprawson, R.A.M.C.

The diagrams illustrating the operations were drawn by Henry Tonks (late Lieut., R.A.M.C.).

OZÆNA AMONG THE VARIOUS RACES OF THE EARTH.¹

By J. N. Roy, M.D.,

Physician to the Hôtel-Dieu, Montreal, Canada; late Special Delegate of the Canadian Government; Laureate of the Academy of Medicine of France.

As we have had, through extensive travels during the last ten years, the opportunity of coming into contact with the principal people of the globe, and have thus been in a position to study on the spot anatomical, physiological, and pathological conditions, we have considered it proper to publish our observations and conclusions in regard to ozæna. To escape repetition, and especially to remain on purely scientific grounds, we shall divide the people of the earth, from an ethnical standpoint, into three large families—the white, the black, and the yellow. Indeed, if we consider carefully the characteristics of the Malays and the Redskins, we find that the representatives of those two races have had the Mongolians for ancestors. The colour of their skin,

¹ Read before the Congrès Français d'Oto-rhino-laryngologie, Paris, May, 1914.

the shape of their eyelids, the development of their malar bones, the flattening of the base of their nose, the thickness of their hair, and, generally speaking, their general facial expression, are all arguments in favour of the theory. Moreover, we find in the language of certain Indian tribes of South America a number of expressions very similar to certain Japanese words, and inscriptions and writings—undoubtedly vestiges of those which adorned the shrines of Buddha—are also often found in Mexican ruins.

We shall have little to say about the white race, as such a large number of articles on ozæna have already been published; we simply shall draw some conclusions from what we observed in cross-breeds of white with either of the other two races.

The blacks are particularly interesting, and a careful study of them in Africa, America, and Oceania reveals some very instructive facts. In the course of an extensive voyage around the Dark Continent we examined the nasal cavities of nearly five thousand negroes in twenty-two different colonies. On several occasions we penetrated into the interior of the country a long distance from the coast-line, and visited about a hundred different tribes. After making a most careful and minute examination of those aborigines of Africa all over the country, we may state, considering the large number that came under our notice, that they do not suffer from ozæna. We made a particular study of those races which are not full-blooded or pure—as the Mulattoes: the Moors of Mauretania, of Arab and particularly of Berber descent; the Peuhls; the Foulahs, whose ancestors were the Egyptian Fellahs; the Hottentots and the Bushmen, in whose veins there is a certain quantity of Mongolian blood; the Danakils, Somalis, and Gallas, of mixed Arab breed; and, finally, the Abyssinians, who at various periods of their history were often in close contact with the Egyptians. Those people also showed no signs of atrophic rhinitis. This disease is also unknown among the negroes we examined in Oceania and in the West Indies, and we had to return to the American continent to find it.

During our stay in Brazil, where three-quarters of the population is black, in Central America, and in the United States, we were surprised to find a large number of cases. We discovered it in pure breeds as well as among the Mulattoes and the Zambis (the offspring of negroes and Redskins).

Our excellent *confrères*, Drs. Chardinal (of Rio de Janeiro) and Jones (of Newport News, Virginia), also found a number of blacks afflicted with ozæna. Their findings show that the disease appears to be less prevalent among the negroes and mulattoes than among the white and yellow race, and we are entirely of that opinion. Their mucous membrane in general is very resistant to infection, and it requires a prolonged contact with very virulent microbes to cause a disease.

The yellow race of Asia and its different ramifications which spread practically all over the globe are particularly predisposed to atrophic rhinitis. We found it not only in the Chinese and Japanese, but also in certain Indo-Chinese of Mongol cross-breed, in the Esquimaux, the Laplanders, the Finlanders, the Malays, the Philipinos, the Hovas, and the Redskins. The frequency of the disease varies according to certain conditions, which we shall try to explain now in studying the causes of ozæna among the different races.

Contrary to the opinion expressed by F. Fraenkel, Gottstein, Coue-

toux, Boulay, and many other authors, who believe that ozena is preceded by a pre-atrophic hypertrophic rhinitis, we agree with Bosworth that such is not the case. We examined the Chinese in their own country, in tropical climes, and in cold countries such as Canada in winter, and we did not find that climate was a factor in the frequency of the disease.

By studying a large number of cases, we found, generally speaking, that Mongolians have a tendency to atrophy of the anterior third of the inferior turbinal without any pathological symptoms. This is particularly evident if they reside in a hot climate; and in colder countries, we find they suffer from hypertrophic rhinitis, though not as often as whites. The Indians of the American continent are predisposed to that kind of atrophy, which is also found in a lesser degree in the cross-breeds. In none of the cases does the enlargement of the inferior turbinal seem to have any influence on ozena, the frequency of which varies according to the more or less contaminated surroundings. Moreover, the African negroes often suffer from hypertrophic rhinitis if they live in a cold damp clime, though they do not show any lesions in their own country. We were astonished at the frequency with which we observed the deviation of the septum in the yellow race and especially in the Indians, among whom we found it in no less than 40 per cent. of all those we examined. This malformation is also more frequently found in the cross-breeds than in whites.

We scarcely ever found compensatory hypertrophic rhinitis in the largest side of the nasal cavities in the Mongolians; more often we observed the presence of a muco-purulent discharge with a crusty deposit devoid of odour. This corresponds to a state of pseudo-ozena. In cases of true ozena we found the odour weaker and less repulsive than in whites and blacks. We draw particular attention to this fact and believe it to be due to a physiological increase in the quantity of the nasal secretions proper to that race, which prevents the drying of pus and thus shortens the life of bacteria and partly prevents the formation of their toxins.

The deviation of the septum in the Mongolians, combined with the formation of non-ozenatous mucosities in much expanded nasal cavities, is an argument against the theory expressed by Zautal, who maintains that atrophic rhinitis is found in those individuals who possess very large nasal cavities, where the weakness of the air draughts allows stagnation and decomposition of the secretions. On the other hand, the negroes—scarcely ever showing any deviation of spurs of the septum—have the arch of their palate lower than in the white and yellow race, the nose flat and broad with wide nostrils, and in Africa they do not suffer from ozena.

We shall not bring forward arguments to offset the theories of epithelial metaplasia sustained by Siebemann, or against Zarniko's theory of tropho-neurosis, or that of osteomalacia of Cholewa, or primary infection of the sinus, as advanced by Vieussens-Grünwald: we shall simply repeat that there is no atrophic rhinitis to be found among the natives of the Dark Continent. The same may be said about tuberculosis which also exists in those countries.

The infection theory of ozena appears to be the only one which will satisfy every demand. We do not intend to discuss again, as it has already been done on several occasions, the value of the capsulated *cocco-bacillus* of Löwenberg, of the pseudo-diphtherie bacillus of

Belfanti and Della Vedova, and of the small bacillus of Pes and Gradenigo. We believe the cocco-bacillus of Perez (of Buenos Ayres) is really the specific vehicle of the infection, since experiments conducted in the laboratories confirm and prove that theory. The cocco-bacillus when injected into the circulation of an animal is the only one which causes atrophic rhinitis with the characteristic odour of ozæna. The other microbes found in the nasal cavities only act as secondary agents.

After examining in both Americas a multitude of Indians belonging to twenty-seven different races, and a large number of cross-breeds, we observed that local conditions and surroundings cause a more or less frequent appearance of the malady. Rare enough in those parts of the country where the natives live on high ground scattered in the open-air, the disease is found much more frequently in the towns and on the plains where they live under more congested conditions and breathe impure and contaminated air. Among the latter we even found the disease in about 6 per cent. of the population, and as the women are more confined to their homes and live in a more secluded manner than the men, they are more often infected. We observed the same conditions in Malaysia, China, and Japan.

Redskins and cross-breeds are equally infected by ozæna; still the yellow race appears to be more susceptible to the disease than the whites. We believe the reason for this condition is to be found not only in the filth some of the Mongolian races are addicted to, but also to the want of symmetry in their nasal cavities. The deviation of the septum which we observed very often in them, naturally causes respiratory defects and a greater abundance of stagnant secretions than in the whites—with equal lesions—and the bacillus of Perez finds a field quite prepared for its culture and development.

In Madagascar, our excellent *confrères*, Dr. Fontoynt, and his assistant, Dr. Roton, were kind enough to show us some cases of true ozæna among the Ilovas. It is interesting to note that that race, which is of Malay descent with a slight mixture of Hindu blood, is the only one which shows any susceptibility to the infection, though they come in fairly intimate contact with the negroes who do not yet suffer from that disease.

That ozæna is distinctly of microbic origin is most conclusively proved by observations in Africa. Of all the blacks we examined in that vast continent, not one was infected—not even among the natives of mixed descent, whose ancestors may perhaps have suffered from the disease, which probably disappeared through the purifying agency of the sun's rays in a sand-covered, tropical region. And yet, when removed from the slave coast to Brazil—to an equatorial clime similar to that of their own country—these negroes, in contact with the infected aborigines, soon become infected themselves. When transplanted to the northern parts of South America, into Central America, or to the United States, they brought the disease with them or contracted it in these countries. Their Mulatto or Zambis descendants in turn were infected, and, according to statistics, these blacks are more often contaminated than those of pure blood. This is probably due to their closer and more intimate connections with the white and yellow races, and also to the heredity of the diathesis of the latter, which in a general manner reduces to a great extent their powers of resistance.

It is thus very evident that the blacks are not immune to ozæna,

and it will be interesting to know how long Africa and Oceania will remain free from contamination, and particularly the West Indies, which would seem to be more exposed to the infection, since they are inhabited to a great extent by Mulattoes who often visit the American coast.

Now, if we are allowed to draw certain conclusions from the observations we collected from all quarters of the globe, we may say that ozæna is an infectious disease and is found in all races. Yet the disease is less frequent among the blacks than among the whites, and is most prevalent among the yellow race. The marked deviation of the septum on these latter, to which we must add their state of habitual uncleanness and nasal irritation, produce in their mucous membrane a splendid breeding ground for the microbes.

The blacks of Africa, Oceania, and the West Indies are not yet infected, although they are susceptible to the disease, and the small number of Europeans who came under our notice—and they were not afflicted with ozæna—does not allow us to express an opinion as to the future apparition of the disease in those countries.

SOCIETIES' PROCEEDINGS.

ROYAL SOCIETY OF MEDICINE—OTOLOGICAL SECTION.

November 17, 1916.

H. J. MARRIAGE, *President of the Section, in the Chair.*

A Further Case of Otosclerosis associated with Otitis Media.—

J. S. FRASER—(*continued*).

MR. C. ERNEST WEST: I am obliged to Mr. Fraser for showing us these specimens. I should like to ask a few questions with regard to the case of otosclerosis. This woman was aged something over sixty when she met with her death. How long had she been deaf? How long does Mr. Fraser think the condition had been going on—if it had been going on at all? If it had not been going on, what was the exact nature of the resting condition? And what is it that leads to progress in one case and to arrest in another? Histologically, are these patches of so-called osteitis vasculosa inflammatory tissue, or are they merely altered tissue—post-inflammatory tissue? I think that one very important point which Mr. Fraser brought out in connection with his previous demonstration was the anatomical feature respecting the existence of a layer of what one might call cancellous bone really surrounding the true capsule of the labyrinth, and lying between it and what one might call the adventitious capsule, which is really a part of the petrosa. That seems to be the central part of his work so far as it affords a basis for the spread of an inflammatory and presumably infective process, whether it has penetrated from the tympanum or has originated by deposition, by blood infection. This case, in which there

are apparently typical otosclerotic lesions on the one side and manifest results of past suppuration on the other, does lend colour to the theory that otosclerosis is essentially an infective or post-infective process originating in the tympanum. I reluctantly admit that I have been struck by Mr. Fraser's demonstration in that sense. I think it is important that we should arrive at a definition of what we mean by otosclerosis—whether a pathological process demonstrable histologically, or a clinical condition of a certain type as regards appearances, symptoms, and the like. At present we are a little liable to be at cross-purposes in our discussions, because we do not know whether we are



FIG. 19.—Fracture of cranial base with injury to labyrinth capsule. P. B —, male, aged forty-one. Horizontal section through right ear just above round window. No. 235.—1. Fracture of promontory. 2. Both peri- and endo-lymph spaces of posterior canal contain blood. 3. Vestibule with slight hemorrhage. 4. Line of fracture reaches canal for nerve to ampulla of posterior semi-circular canal. 5. Basal coil of cochlea with hemorrhage in all three scales. ($\times 8$)

talking of a pathological process demonstrable under the microscope, or of clinical types of deafness familiar to all of us. Before I sit down I should like to make a protest on the ground of accuracy in the use of terms. I am an upholder of exactness of phrasing as far as possible. The term I object to is "chronic adhesive process." I do not know what it means. I do not see any evidence for it in Mr. Fraser's slides. I see evidence of post-inflammatory conditions, but I see no reason why this should be called a chronic thing, any more than one's boot is chronic because it is always on one's foot. The condition is a resting one, and "chronic" to my mind implies a process which is going

forward. It may be that there is a cicatrised tympanum—that there has been post-suppurative cicatrization. That is the way I should like to see it described. Ultimately, it seems to me, the turning-point of the discussions will hinge on the question of aetiology. When we have arrived at some clarified ideas with regard to aetiology, it is conceivable that we may arrive at some ideas as to treatment. I do not mean treatment when the patient has a developed otosclerosis, but treatment rather in the preventive or the abortive sense. It is extremely important that we should have laid before us, in as categorical a manner as possible, the views of those who are working on the subject as to

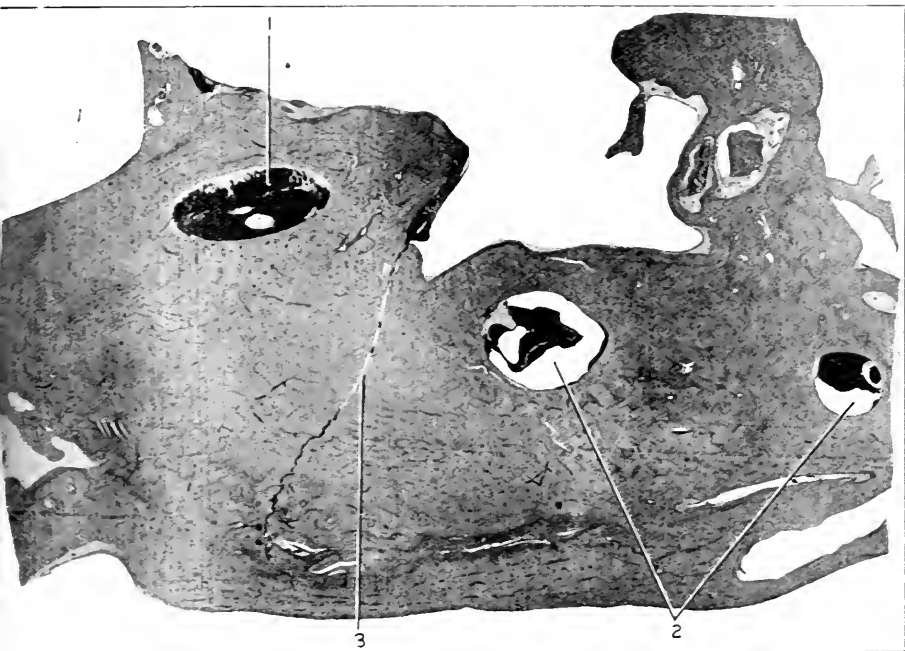


FIG. 20.—Fracture of cranial base with injury to labyrinth capsule. P. B.—, male, aged forty-one. Horizontal section through right ear below round window. No. 300.—1. Extensive hæmorrhage in spiral ligament in lowest part of basal coil of cochlea. 2. Both ends of posterior canal show blood in endo- and perilymph spaces. 3. Line of fracture which does not quite reach dura mater of cerebellar fossa. ($\times 8$.)

whether this is a definitely infective condition—as to whether the process is due to some toxic or degenerative change taking place in tissue naturally prone to it, or whether we have to do with a chronic osteomyelitis. If so, there ought to be changes taking place progressively, and such appearances as Mr. Fraser has shown this evening in this woman aged sixty ought to be different from those in a patient aged twenty-five who is a progressive otosclerotic. That seems to me a point which Mr. Fraser should take up. There is one other point that appeals to me, and that is the light which is thrown upon the formation of labyrinthine sequestra. One is familiar with the way in which the labyrinth is sometimes shelled out, with the inner

layer of the capsule intact, over wide areas, not only in septic but in tuberculous cases, and we see a reason for that demonstrated in this cancellous sheath which runs round and over the ossified cartilage of the primary labyrinthine capsule. I have been leading nowhere, I fear, except to ask questions, but I am very grateful to Mr. Fraser for what he has shown us.

Dr. DAN MCKENZIE: I have always listened with pleasure to what Mr. West has to say, and it has been very interesting to hear from him that he has been convinced by to-day's demonstration that the inflammatory changes in the ear may lead to osteitis vasculosa. We have only seen two cases, however, in which this has occurred, and one would like to see more before arriving at definite conclusion, since both of these cases may simply have been coincidences. We do not know anything about their previous history: they are simply *post-mortem* specimens. This should make us wary about overestimating their value in controversy. On the other hand, it is difficult not to believe that there is some connection between inflammatory changes and these bone changes in the ear. It is not surprising that there should be such bone changes in inflammation of the mucosa of the ear. We must never forget that Politzer's typical otosclerosis, according to him and his fellow-workers, is characterised by the fact that in the mucosa of the middle ear there are no changes to be seen, and in the patient there is no history of former attacks of middle-ear trouble. It is difficult, I admit, to exclude all middle-ear trouble of infancy. I suppose very few of us have escaped such attacks, and yet the cases of otosclerosis among the generality of us would be insignificant. In other words, we have the association of a common occurrence and an uncommon sequel, and when this is the case there must be a third factor intervening to explain the sequel. It is true that another point in favour of the local cause is—what seems to be the case here—that one meets with cases of otosclerosis without any evidence of rheumatoid or arthritic trouble elsewhere. We get bone change precipitated locally in the ear in the temporal bone, and we naturally look for a local cause. The most obvious local cause is an inflammatory one.

Dr. A. A. GRAY (Glasgow): Mr. Fraser is to be congratulated on his results; it has been a great pleasure to inspect such beautiful specimens. Now, as regards Mr. Fraser's view as to the nature of otosclerosis, I am afraid I must say I am not entirely in agreement with him. I have examined half-a-dozen specimens of otosclerosis, and I have never seen any inflammatory change in the bone. I have never seen any round-cell infiltration nor any sign of inflammatory activity. It is difficult to accept the view of the disease being inflammatory when such a sharp line of demarcation is present. I mean that I can hardly conceive an inflammatory change stopping abruptly with the sharpness of the otosclerotic focus. It rather gives one the impression of a tumour—a new growth. With regard to infection from the middle ear being the cause of otosclerosis, it is quite true that Mr. Fraser has shown us two cases apparently illustrating this; but one must remember the number of cases which show the contrary. I have made pathological investigations of several cases of suppurative middle-ear disease, and I have not found otosclerosis in any of them; at the same time I know that the two conditions may occur coincidently, and I think that Mr. Fraser has happened to light upon two such cases. In these one must look for some antecedent tendency. Cases which fall into this category are not

necessarily chronic suppurative cases; they may be cases of acute middle-ear inflammation. I recall such a case of middle-ear inflammation: it was very painful and acute, but healed without suppuration. The patient, however, to her physician's perplexity, continued to get more and more deaf. The explanation of the condition was that there was a marked tendency to otosclerosis in her family. The left ear—which was the side affected—gradually became more and more deaf, the right ear remaining perfectly healthy all the time. But, sixteen years later, she had an attack of appendicitis, and at the same time the right ear became slightly deaf and there was tinnitus; this was followed a little later by a second attack of appendicitis, and later by a third attack, after which the appendix was removed. Then the tinnitus disappeared, the degree of deafness remaining approximately the same. This was a case of acute middle-ear inflammation exciting otosclerotic change in the bone on one side; then, after the lapse of sixteen years, the other ear began to be affected. One might say that this was a case due to infection. It may have been infection from the appendix, but it was not from any acute or chronic middle-ear inflammation. In most, if not all, of the cases of otosclerosis I have clinically examined that have apparently started from suppurative middle-ear disease, on going carefully into the patients' histories and eliciting the facts and getting information as to deafness in relations, such as uncles and aunts, as well as parents and grandparents, I have almost always found evidence of some family deafness. I do not believe that otosclerosis can occur in the majority of individuals. It is true that we never know what we carry about with us in our body, but the majority of people could not be otosclerotics by any process whatever; and, on the other hand, there are a certain number of individuals who can never be prevented from becoming otosclerotics, because the tendency is so strong. And between these two classes of persons there are a number who will become otosclerotic under certain conditions which induce changes in the bodily constitution—*e. g.*, typhoid fever, pneumonia, exhaustion, or various other conditions of that nature. In these cases otosclerosis is contingent upon this immediate condition, but the essential factor lies in the personal quality of the individual. The organ of hearing will withstand damage from various causes up to a certain point, but beyond this in some individuals it will give way, and in others it will not give way.

Mr. R. LAKE: At the International Congress of Otology, held at Boston in 1912, Prof. Siebenmann (I think it was) showed a large number of photographs, and among them were some from patients who had suffered from suppurative otitis, in which these patches of osteitis were extremely large. I am inclined to think the case we are discussing this afternoon is due to a similar condition.

Sir WILLIAM MILLIGAN: I am not prepared to argue the point from microscopical appearances, because I have done so little work on otosclerosis along this line. But I think it will be difficult for Mr. Fraser to prove that otosclerosis is secondary to a septic condition of the middle ear. The number of cases of suppuration of the middle ear is legion, but the number in which otosclerosis is present as a complication is very small. We have, I think, to look to an entirely different ætiological factor as the causative agent; probably it will be found to be some anomaly in one or other of the internal secretions of the body. I have always been struck with the relation between anomalies of menstruation and otosclerosis. The time at which the otosclerosis first

manifests itself in young girls is about that at which menstruation commences. I am not prepared to say it is a question of cause and effect: it is only a striking fact. There is a deficiency of lime salts in the blood of many of these otosclerotics: is that connected with the production of the disease? Against Mr. Fraser's view there are also the objective evidences from clinical examination. In many of the vast number of cases of otosclerosis there is no sign of there having been any middle-ear disease, nor any history of such either. I quite agree with Dr. Gray that we have closely to investigate the family history of these patients: if we do, we shall find some hereditary tendency, and most frequently on the female side. It may be a case of hereditary transmission of defect in internal secretion. There will have to be a great deal of work done by Mr. Fraser before it will be possible for him to convince the Section that otosclerosis is the outcome of a previously existing, or actually existing, suppurative otitis media.

Mr. FRASER (in reply): I am very much obliged to the members of the Section for the way in which they have received my communications. The President's remarks emphasise the need for the co-ordination of research. General surgeons tell us that in cases of fracture of the base the deafness only comes on after the patient has more or less recovered from his injury. I maintain that this is not so. The deafness is present all the time, but only becomes manifest when the patient recovers control of his mental faculties and finds that in one—more rarely in both—ears the hearing has been lost. I feel sure that if such cases were examined by otologists these views would be found correct.

With regard to otosclerosis, the theory that I support—namely, that in many cases otosclerosis is due to an inward spread of otitis media into the labyrinth capsule—has met with a good deal of criticism.

In answer to Mr. West, I can only say that I am sorry that the clinical history of my case is so imperfectly known. Mr. West objects to the term "chronic adhesive process." It is quite possible that a better term might be invented, but the words serve to indicate the conditions which exist in the middle ear when a catarrhal or purulent otitis media results in the thickening of the tympanic mucosa and the formation of adhesions. In some of these cases, at any rate, the old term "chronic catarrhal otitis media" is really more accurate as an inflammatory process is still going on. In other cases the term "cicatrised tympanum" would be more correct.

Sir William Milligan and Dr. Gray do not agree with me as to the inflammatory nature of the changes in otosclerosis. I have never maintained that otitis media is the "be all and end all" of otosclerosis. We have all suffered from head colds and a certain amount of tracheitis and bronchitis, and yet we do not all have chronic bronchitis or bronchiectasis. Most of us have had some indigestion and hyperchlorhydria at one time or another, and yet we do not all suffer from gastric or duodenal ulceration. Every case of catarrhal rhinitis does not settle down in the middle meatal region and result in nasal polypus formation. In the same way very many children have attacks of otitis media, and yet they do not all develop otosclerosis later in life. Undoubtedly there is another factor—the hereditary tendency to the disease. In susceptible people the region of the oval window is a *locus minoris resistentiæ*. If a child with a tendency to otosclerosis gets an attack of otitis media, I believe that otosclerosis is very likely to develop. Dr. Gray made some remarks last May which appear to me to show that he also was inclined

to this view. There is also a growing amount of evidence to support the view that in certain families cases of otitis media are specially likely to develop intra-cranial complications. The only way to get rid of the hereditary tendency would be to forbid people to marry if there was a strong tendency to otosclerosis in the family. Koerner takes this line, but it seems rather a "large order."

If Sir William Milligan will read the conclusions to the article by Mr. Muir and myself in the November issue of the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, he will see that we do not claim that all cases of otosclerosis are secondary to otitis media. We believe that there is a "primary" variety which occurs with an apparently normal middle ear, and is usually seen in young women. In such cases the infection probably comes by way of the blood-stream, and the condition appears to be allied to osteomalacia. In the second class of case the otosclerosis is "secondary," and is due to an inward extension to the labyrinth capsule of an otitis media. In this variety the sexes are probably affected more or less equally. Lucae was of opinion that in chronic progressive middle-ear deafness it was impossible to draw a sharp line between cases of chronic adhesive process in the tympanum and those in which otosclerosis was present, and I believe that subsequent observations will still further support that view.

The most important question to decide is this: Is otosclerosis an inflammatory condition, or is it not? I believe that it is, but my opinion is not of great value. It is a very different matter with regard to the opinion of Mr. Richard Muir, who is one of the best known pathologists in this country. Mr. Muir holds that otosclerosis is undoubtedly of inflammatory origin. Dr. Gray can see "no sign of inflammation," and yet in the osteoporotic areas we find rarefied bone, in the spaces of which there are dilated blood-vessels surrounded by numerous small cells. Giant cells are also found in many cases. These appearances bear strong evidence of an inflammatory character.

I have been asked why, if otosclerosis follows otitis media, it is always located in the anterior margin of the oval window. I have shown you that in the present case the area of otitis vasculosa in the left ear was much more extensive, and affected not only the anterior margin of the oval window, but also the bony prominence of the external canal and the apex of the cochlea. I think it was Politzer who showed that at the anterior margin of the oval window there is a vascular connection between the vessels of the middle ear and those of the labyrinth capsule. Bruehl has also pointed out that this area is liable to special stress on account of the movements of the anterior part of the footplate of the stapes, and the presence of the tendon of the tensor tympani muscle in this region.

Sir William Milligan believes that there is some connection between the occurrence of otosclerosis and disorders of internal secretion. Well, of course, the ductless glands are all "the rage" at present. After failing with iodides, phosphorus, fibrolysin, otosclerol, and radium, I am now doing my best to be in the fashion, and am treating cases of otosclerosis with extracts of the ductless glands—pituitary, thyroid, and suprarenal. As yet the duration of treatment has been far too short to enable me to give a report on the results. My own view, however, is that it is *most important to make sure that cases of catarrhal and suppurative otitis media in children really do clear up completely*. Such cases should be carefully watched and treated for a long time after the acute

symptoms have passed off. It is to be hoped that the attention now being paid to the operative treatment of the nose, nasopharynx and fauces of young children may result in fewer cases of otitis media, and a better recovery from this affection when it does occur. If this is so, we may expect to see a decrease in those cases of otosclerosis which are secondary to middle-ear inflammation. Vaccine therapy in cases of recurrent catarrhal otitis media may also be of use.

Since I have adopted the President's method of immediate skin-grafting at the end of the radical mastoid operation, and have observed the excellent results obtained, I have come to the conclusion that it would be quite justifiable to operate on cases of otosclerosis. I suggest that after the completion of the radical operation, the bony cap of the lateral canal should be removed without injuring the endosteum and a skin-graft applied at once. In this way a movable window would be supplied to replace the ankylosed oval window. The operation should, of course, in the first place be performed only on the more affected or deafer ear.

Dr. Dan McKenzie suggests that it may merely be coincidence that in these two cases otosclerosis was associated with otitis media. If this is his opinion, I do not agree with him. In the present case the patient had only slight remains of otitis media on the right side, but on the left there was a marked adhesive process in the upper part of the tympanum, while a perforation was still present in the lower part of the drumhead. It was on this left side also that the osteoporotic changes in the labyrinth capsule were most marked. The bony ankylosis is also more extensive on the left side.

(Note.—January 11, 1917: Since my return from London I have examined microscopically a *third* case of otosclerosis associated with chronic purulent otitis media. I hope to show this case to the Section at an early date.—J. S. F.)

There does seem to be a loss of trophic nerve influence in cases of otosclerosis, as evidenced by diminished sensibility of the external meatus and drumhead, and diminution or absence of the secretion of wax. The question is, Which is the cause and which the effect? If otosclerosis is an inflammatory condition, it cannot be entirely due to loss of trophic influence, but it is quite possible that weakening of this trophic influence may be an important factor in the pathology of otosclerosis; indeed, it may be that this is the way in which the hereditary tendency to the disease manifests itself.

A Note on the Monochord, with some Illustrative Figures.—

W. M. Mollison.—Ear tests are of doubtful value, but some of those in common use are at least interesting, and serve to differentiate cases of deafness into two main classes. Of these tests, that for determining the *upper tone limit* is perhaps the most interesting; it has always been doubtful what is actually the highest note appreciated by the normal ear, and I do not think it is important. What is of interest is that the upper limit is fairly constant and can be very accurately determined. The instrument which appears to me to give the most constant results is the monochord. It consists of a length of steel piano wire stretched between two points on a steel frame on which runs a bridge; this bridge grips the wire and so alters the effective length of wire which is to be thrown into vibration. Longitudinal vibrations are produced in the wire by rubbing it with resined leather (Tyndall) or with cotton-wool

soaked in spirit. The great advantage of the monochord is that the note produced depends on three factors only: (1) The length of wire thrown into vibration; (2) the calibre of the wire; (3) the material. These three factors are easily standardised, and so an instrument is produced which gives always the same notes and requires no complicated standardising when finished as in the case of Galton's whistle.

The monochord has another advantage pointed out by Mr. Scott some few years ago: not only can the upper tone limit through air be tested, but also that through bone: the possibility led to the discovery that Rinne's test with high notes is always negative. The accuracy with which the upper tone limit can be defined is most striking: a difference of $\frac{1}{2}$ c.m. in a length of 20 cm. is quite easily appreciated by the patient.

The results of the tests are expressed in lengths of wire the note from which the patient hears as a squeak: the result for hearing through air is placed above that through bone (the frame of the monochord being held on the mastoid process): thus for normal individuals the result is $\frac{1.3}{1.1}$ as an average.

The following are cases of shell shock or gun deafness and are chosen as typical of such cases.

Age.	Hearing for whisper or conversation speech.		Monochord.		Notes
1 21	4 to 5 ft.	3 to 4 ft.	$\frac{1.6}{1.4}$	$\frac{1.7}{1.4}$	In France fifteen months.
2 37	1 to 3 ft.	1 ft.	$\frac{1.7}{1.4}$	$\frac{1.6.5}{1.4.5}$	In the artillery.
3 40	2 to 4 ft.	3 to 5 ft.	$\frac{1.6.5}{1.5.5}$	$\frac{1.6.5}{1.5.5}$	Royal Field Artillery; always tinnitus after shooting.
4 35	8 in.	3 to 4 ft.	$\frac{3.0}{1.8}$	$\frac{1.8}{1.4}$	Shell shock and gun fire.
5 26	A. c.	3 to 4 ft.	$\frac{3.6}{3.0}$	$\frac{3.1}{2.1}$	Shell shock.
6 38	3 in.	4 in.	$\frac{0}{4.5}$	$\frac{2.6}{1.7}$	Buried by shell one month ago; previous middle-ear catarrh.
7 24	8 to 9 ft.	2 ft.	$\frac{0}{0}$	$\frac{0}{0}$	Left eye destroyed by bullet; tinnitus before war; upper tone limit. \pm 4000.
8 40	8 to 10 ft.	9 to 11 ft.	$\frac{2.5.5}{1.6}$	$\frac{2.6}{1.7}$	Eight months ago a high explosive shell destroyed both eyes.
9 20	6 in.	3 in.	$\frac{3.0}{1.4.5}$	$\frac{2.8}{1.8}$	Lost both eyes from shell explosion.
10 24	1 ft.	12 ft.	$\frac{1.8}{1.4}$	$\frac{1.5}{1.4}$	Tinnitus: knocked down by sandbags.
11 44	1 in.	6 in.	$\frac{0}{1.8}$	$\frac{3.2}{1.8}$	Previous deafness; no shell shock; Rinne negative.
12 46	4 ft.	2 in.	$\frac{2.2}{1.6}$	$\frac{4.2}{2.2}$	Tinnitus four years; much quinine in India.
13 21	3 to 8 ft.	10 ft.	$\frac{1.3.5}{1.1}$	$\frac{1.3.5}{1.1}$	Had been exposed to very severe shelling; thirty a minute for half an hour.
14 24	0	0	$\frac{3.4}{1.6}$	$\frac{3.4}{1.6}$	Functional dumbness and blindness cured by suggestion: with an electrical aid could hear quite well with left ear

Traumatic Dislocation of the Incus, which was found lying in the Antrum in the Course of a Radical Mastoid Operation.—W. M. Mollison.—C. P.—, aged thirty-eight, was exposed to a violent explosion in April, 1916. The explosion occurred about twelve yards from him on his left-hand side. He was unconscious for twenty-four hours: he then found he was deaf in the left ear. Soon after discharge began and has continued. He has some pain in the ear and slight tinnitus.

On examination in July, 1916, there was found a large perforation in the left membrana tympani posteriorly: there was foul pus coming from the middle ear. Hearing in the ear was *nil*.

On account of the foul otorrhœa, the radical mastoid operation was advised. This was done in October. The mastoid process was cellular, but contained no pus: the antrum was, perhaps, a little larger than normal, but it contained no pus. Whilst curetting was being done in the antrum and towards the aditus to remove small spicules of bone due to the gouging, the incus was found lying quite loose and bare, and stained by powder (?). The radical operation was completed, the malleus was in position, and the anterior half of the membrane affixed to it: a particle of powder (?) on a small granulation was lying over the stapes. The cavity was skin-grafted. The malleus and incus are shown.

A Case of "Cerebellar Storm."—W. M. Mollison.—Dr. Fawcett has kindly allowed me to bring forward these notes on a case which was under his care in Guy's Hospital.

Nurse P—, aged twenty-four, had a mild attack of German measles on March 7, 1916: she was apparently well in about a week, except for severe rhinitis. On March 16 she was walking in the hospital grounds when she felt sick and vomited. She had vertigo and vomited several times on March 16, 17, 18, and 19, and was quite unable to take any food at all. At the request of Dr. Fawcett I saw her on March 20. She lay in bed with her eyes closed, and through the lids the eyeballs could be seen moving. She felt very giddy, complained that objects moved from left to right, and that she herself felt as if she were moving. There was marked vertical nystagmus, with deviation of the eyes upwards and the quick movements of the eyes downwards.

Examination of the ears showed a little wax in the right, but a normal membrane with ? slight retraction; on the left side the membrane was a little pink in its posterior part. There was no mental clouding: she resented being turned over for examination as it made her more giddy. She retched frequently. The optic discs were normal.

Mr. Sydney Scott kindly saw her with me, and the following points were noted: The patient heard a whisper at least 8 ft. from either ear; the appreciation of low tones was normal (sixteen vibrations per second being heard). Rinne's test was positive, and the upper tone limit normal (monochord 14.5 cm.). There was no pain in the ears, and she had had none. The patient yawned frequently; knee-jerks were very brisk. Achilles jerks normal, plantar reflexes flexor: abdominal reflexes present and a well-marked *white tache*: there was slight impairment of movements of pronation and supination of the right forearm compared with the left. There was a *pointing error* in the vertical plane; the arm passed much too far upwards, especially on the right side: in the horizontal plane the fingers fell below the starting-point on both sides, but perhaps this was due to lack of effort on the part of the patient.

Lumbar puncture showed the fluid to be under very decidedly increased pressure, and one and a half test-tubes were drawn off: the fluid was clear and normal. It was not considered wise to apply the caloric tests on account of the vertigo already present.

Dr. James Taylor also saw the patient. No definite diagnosis was arrived at, but it was agreed that the condition was due to some cerebellar irritation of unknown origin. Potassium bromide was given *per rectum*. The patient could only take small amounts of lemonade and peptonised milk for the next two or three days.

On March 24 objects still seemed to move from left to right. Vertical nystagmus was still present, combined with lateral nystagmus to the left when looking to the left. There was no vomiting.

March 27: Patient was much better: lateral nystagmus to the right.

March 28: Nystagmus was now right rotatory on looking to the right, but lateral when looking to the left: no vertigo: rhinitis considerable.

The patient continued to improve, and by April 12 could sit up, though this made her feel somewhat giddy: there was then slight vertical and right rotatory nystagmus. After that the patient made a perfect recovery, and she is now back at work.

Labyrinthine Irritation in a Patient on whom a Complete Mastoid Operation had been performed some years previously.—**Somerville Hastings.**—M. J——, a young woman, aged thirty-one, had a left complete mastoid operation performed for chronic ear discharge eight years ago. The wound healed well, and for two years she had no trouble at all. Six years ago the discharge began again and was accompanied by tinnitus, and both have continued ever since. Three years ago she began to be troubled by giddiness, and this has also continued. The giddiness comes on at all times of the day and night, and she tends to fall to the left. When first seen on November 7, 1916, the left ear and mastoid cavity were filled by foul-smelling epithelial *débris* and pus. On removal of this, ulceration was seen on the inner wall of the middle ear, immediately below the promontory. The hearing in the right ear was good, but nothing was heard on the left by air conduction. On the left mastoid C₆₄ and C₇₋₁₂ forks were heard when vibrating strongly. The fistula symptom was well marked, and increased pressure produced rotatory nystagmus to the right with falling to the left. The left labyrinth reacted readily to cold, and rotatory nystagmus to the right was produced in ten seconds.

I should be glad of the opinion of members as to whether a labyrinthectomy would be desirable should symptoms still persist now that the ear is being kept clean.

A Doubtful Case of Labyrinthitis—**E. D. D. Davis.**—A married woman, aged forty-six, attended the hospital seven and half years ago, February, 1909, for left middle-ear suppuration of twelve months' duration, with a large perforation in the lower and posterior part of the drum. She complained of tinnitus, which was arrested by compression of the carotid. She returned six weeks later with a mass of granulation tissue in the meatus, which suggested a malignant growth. The section merely showed granulation tissue, but a radical mastoid operation was performed by Major Waggett. The facial nerve was

exposed and a temporary paralysis occurred, but the face recovered within two months, when the ear was healed and dry. After the operation the patient complained of attacks of vertigo, which have persisted up to the present.

When she was seen a fortnight ago the gait was staggering, and there was a tendency to fall to the left. There was no nystagmus, the pupils were equal and reacted to light; the disks were normal. The knee-jerks were exaggerated. Rombergism was well marked. Irrigation of the ear with lotion at 100° F. produced neither nystagmus nor giddiness. Irrigation with lotion at 105° F. for twenty seconds resulted in giddiness, with a tendency to fall to the same side, but there was no nystagmus. The mastoid area showed slight Eustachian discharge and *débris*. Hearing on the left side was considerably diminished, and bone conduction was reduced.

Mr. J. F. O'MALLEY: In Mr. Hastings's case I advise the performance of labyrinthectomy: the patient seems much incapacitated by the attacks of giddiness and vertigo which occur in the most unexpected manner. At present the ear is useless as an organ of hearing. With regard to the tests, the disturbance of equilibrium points, in my opinion, to the labyrinth on that side being under-active. There is sufficient life in it to cause irritation, but the disturbance of equilibrium is associated with the over-action of the good side. There seems to be a difference between the fistula test response here and that which one usually gets in fistula of the external semicircular canal, which suggests a fistula, not in the canal, but somewhere round the stapes, and this may explain the altered direction of the nystagmus. I think this degree of labyrinthine defect may become dangerous at any moment by failing to indicate the spread of sepsis, and, therefore it would be well to perform labyrinthectomy.

Dr. H. J. BANKS DAVIS: Is Mr. Somerville Hastings certain that the patient has not got cerebellar symptoms? She is in a miserable condition, and before so serious an operation is undertaken, I think cerebellar abscess should be excluded.

Mr. SOMERVILLE HASTINGS (in reply): I thank members of the Section for the expression of their opinions. I thought of letting the case go a little longer, and then, if the patient did not improve, of performing labyrinthectomy. I think it unlikely that she has a cerebellar abscess. The symptoms have been going on for three years, and have varied very little, which is not like the behaviour of a cerebellar abscess.

Case of Malignant Disease of the Ear.—Sydney Scott.—The patient, H. R—, aged forty-nine, an engineer's fitter, had had malignant disease of the external ear, which was first noticed eight and a quarter years ago.¹ Histologically the disease was a small spheroidal celled carcinoma like rodent ulcer, but contained cell-nests and involved lymphatic glands (Prof. F. W. Andrewes). Three operations had now been performed during this period, and the whole of the left auricle with the bony meatus, the mastoid process, the parotid salivary gland, the whole of the sternomastoid muscle, and all lymphatic glands on the left side of the neck have been removed. The last operation was performed in May, 1916, when there was a small recurrence in the middle of the

¹ The patient was first shown in January, 1914; see *Proc. Roy. Soc. Med.*, 1914, vii (Sect. Otol.), p. 23.

scar in the neck. Since this the left vocal cord has become paralysed, but there has been no sign of returning disease until the last few weeks, and now several nodules have appeared in the scar along the clavicle and in the posterior triangle. There is also a large nodule which has commenced to ulcerate over the carotid sheath close to the angle of the jaw. An expression of opinion is sought as to whether any further attempts should be made to remove the disease.

The patient is presented in conformity with the recommendation of the Council of the Section that the after-history of cases shown in the past should be recorded.

The PRESIDENT: I think it would be well to excise the outlying nodules, which are all quite small. It must be a chronic type of case. If the ulceration can be stopped, a great advantage will be gained. Are there any signs of secondary growths anywhere?

Mr. SCOTT: None, so far.

A Post-mortem Specimen of a Temporal Bone from a Case of Cerebellar Abscess.—W. M. Mollison.—The left temporal bone from a patient who died with a cerebellar abscess which gave rise to no symptoms. The posterior surface of the petrous bone shows a small collection of pus lying in the pocket of dura mater over the meatus vestibuli.

Dr. H. BANKS DAVIS exhibited Anatomical Specimens of the Petrous Bone.

Abstracts.

PHARYNX.

Excision of the Retro-pharyngeal Gland.—Norman Patterson. "Lancet," 1917, vol. i, p. 487.

Describes two cases and mentions a third, in which the author has performed this operation. He states that nearly all cases of retro-pharyngeal abscess in children especially, are due to suppuration taking place in one of the two retro-pharyngeal glands.

The operation is described.

Macleod Yearsley.

Pharyngeal Pouches.—N. S. Finzi. "Proceedings of Royal Society of Medicine," February, 1917. Section of Electro-Therapeutics, p. 33.

The author is concerned only with the radiographic examination, appearances, and diagnosis of these cases.

The method used is the administration of a thick paste of bismuth oxychloride and water of such a consistency that, when heaped up, it has practically no tendency to flow back to its level.

The fluorescent screen examination of these cases is most important, as they may be very difficult to distinguish from stricture unless it is seen how the bismuth leaves the pouch. A pouch can be observed to fill, and when full, the bismuth passes into the œsophagus, going past the upper end of the pouch with ease, but being held up lower down in those cases in which the pouch is big enough to press on the œsophagus: in some cases the pouch can be observed to empty into the œsophagus when the patient contracts the neck muscles.

On the other hand in stricture the bismuth passes, if the stricture is not complete, from the lower end of the dilated portion of the gullet. The author finds that when the pouch does not extend into the thorax a true lateral view gives a far better picture than the oblique antero-lateral view, though the latter is always useful. A posterior or an anterior view must also be taken, the former usually giving the clearer picture. He always examines the patients standing up.

What a pouch generally has to be distinguished from is a malignant stricture, but a fibrous stricture may also simulate a pouch: a spasmodic stricture is unlikely to occur in this position.

The cardinal difference between a pouch and any form of stricture, however, is the fact that the former must empty from its upper and the latter from its lower end, and this can generally be made out by a careful screen examination on the lines indicated.

A carcinomatus stricture is usually conical in shape, and has not the bulbous appearance seen in the case of a pouch.

A fibrous stricture may be more difficult to distinguish though it is fortunately rare in this situation. The stricture is likely to give a conical lower end to the bismuth shadow.

If the pouch were so large as completely to obstruct the œsophagus either directly or as the result of inflammation or adhesions, the diagnosis might be extremely difficult. One of the author's cases was very near to this condition, and the patient had, in fact, had a gastrostomy for three years before his pouch was diagnosed and removed.

Archer Ryland.

EAR.

Modified Radical Operation for Chronic Suppurative Otitis Media.—

H. B. Blackwell. "Annals of Otology," xxv, 908

Paper based on eight cases. Purpose, to cure discharge and conserve hearing. The operation consists of: (1) Usual post-aural incision. (2) Usual opening of antrum. (3) Widening of antrum and lowering of posterior bony wall. (4) When short process of incus seen, external attic wall removed. (5) Further lowering of posterior bony wall till facial ridge reached. (6) Necessary curetting of granulations, etc., care being taken not to injure suspensory ligament of malleus or its external lateral ligament. Drum and ossicles are left *in situ*. (7) L-shaped flap cut and sutured to temporal fascia. Antrum and attic region plugged; posterior wound sutured.

[It may be supposed that in the near future no otologist will perform the classical radical mastoid operation in every case. The growing sense of responsibility in the conservation of function will lead him to modify his operation to that end whenever he can do so without danger to his patient.—M.Y.]

Macleod Yearsley.

Syringomyelia with Vestibular Symptoms.—G. E. Shambaugh. "Annals of Otology," xxv, 891.

This case is fully described. The diagnosis of syringomyelia rested upon a long-standing disturbance of sensation of temperature, marked disturbance to pain, and much less marked disturbance of sensation to touch. The nystagmus in the case probably depended upon an extension of the syringomyelic process up into the region of the fourth ventricle (syringobulbia).

Macleod Yearsley.

Involvement of the Labyrinth by way of the Ductus Endolymphaticus.

—N. H. Pierce. "Annals of Otology," xxv, 881.

The author has met with two cases in five years. These are described. All recovered. The author concludes that the duct may be involved more frequently than is supposed in acute softening processes of the mastoid and that the region of the sacculus should be explored preferably to opening the bony labyrinth.

*Macleod Yearsley***MISCELLANEOUS.****Endothelioma of the Right Bronchus Removed by Peroral Bronchoscopy.**

—Chevalier Jackson (Pittsburg). "Amer. Journ. Med. Sci.," March, 1917.

The patient was a clerk, aged thirty-five, whose illness had begun five years previously with a "heavy cold." He complained of wheezing and a feeling of compression in the right side of his chest, also of a sensation as of a ball valve suddenly shutting off sometimes inspiration, and at other times expiration. Hæmoptysis had occurred on several occasions. He had spent two years in a sanatorium for the tuberculous, but no tubercle bacilli had been found in the sputum. X-ray examination showed opacity of the lower lobe of the right lung continuous with the hepatic opacity. Physical examination pointed to obstruction of the right main bronchus. By a process of exclusion the diagnosis was reached of pedunculated intra-bronchial growth. Bronchoscopy, under local anæsthesia, showed a tumour of slightly nodular shape with smooth shining surface almost filling the dilated right main bronchus, and attached to the right wall of the latter just above the orifice of the middle-lobe bronchus. The growth was immediately removed with cutting forceps and the patient was well in a week, and had, when the report was published, been in good health for nine months. Microscopic examination showed the growth to be an endothelioma with evidence of malignancy. The author concludes that diagnostic bronchoscopy is indicated in cases of "monolateral asthma," bronchial obstruction, and in cases regarded as tuberculous when persistent search fails to reveal tubercle bacilli; and that peroral bronchoscopic removal of an endobronchial tumour is feasible under local anæsthesia, and may be justifiable in a malignant endobronchial growth if small, circumscribed, and not ulcerated. As this is the only recorded case of apparent cure of an endothelial endobronchial tumour by peroral bronchoscopy, and only the second endoscopic removal of any form of malignant growth from a bronchus, the author deprecates too many or too sweeping deductions. He adds that one and a half years have now elapsed since the operation, and the patient is in perfect health without expectoration or any other symptom.

*Thomas Guthrie.***OBITUARY.**

ALFRED JOHN MARTINEAU, Major, R.G.A., F.R.C.S.(Ed.), M.R.C.S.,
L.R.C.P.(Lond.).

READERS of this Journal will regret to hear that Major Martineau was killed in France on April 17, shot by a sniper, whilst doing reconnaissance work in connection with his battery.

The youngest son of the late Judge Martineau, he was born in 1873, and was educated at University College School and St. Thomas's

Hospital. At St. Thomas's he had a brilliant career, taking the College first prize in his first and second years, the College second prize in his third year, and the Treasurer's gold medal and the Cheselden medal (Surgery) in his fourth year. He took the M.R.C.S., L.R.C.P. (Lond.), in 1895, and the F.R.C.S. (Ed.), in 1899.

In 1895-96 he was Assistant House Surgeon and House Surgeon in St. Thomas's Hospital, and afterwards Assistant House Surgeon at the Great Ormond Street Hospital for Sick Children, House Surgeon at the Brompton Hospital for Consumption, and then for two years senior House Surgeon at the Nottingham General Hospital.

In 1900 he settled in general practice in Brighton but, soon after being appointed to the staff of the Throat and Ear Hospital there, gave up general practice and devoted himself entirely to throat and ear work. His thorough training in general surgery was of the greatest value to him in his special work, in regard to both his breadth of view in dealing with his patients and his skill and dexterity as an operator. He was never the sort of man who can account for all diseases by a spur on the septum, but had a very deep and broad view of medicine.

As a relaxation from professional work he joined the Royal Garrison Artillery in 1906, and, finding the work intensely interesting, soon gave up the whole of his holidays and spare time to it. At the beginning of August, 1914, he was as usual in summer camp at Newhaven, but, instead of returning at the break up of camp to his practice, he was put in command of the fort at Newhaven, being promoted Major. There he remained during the early part of the war, then after a course of training at Lydd, went in 1916 with his battery to France. For the last ten months of his life he commanded the 19th Siege Battery, and it was while doing reconnaissance work in a wood recently evacuated by the Germans that he was shot dead by a German sniper. How he was adored by his junior officers and men can perhaps be partly realised by those of us who have spoken to, or seen letters from, them. Major Martineau leaves a widow and two sons.

ARTHUR J. HUTCHISON.

CORRESPONDENCE.

MALPOSITION OF CERVICAL VERTEBRÆ CAUSING A PHARYNGEAL SWELLING.

*To the Editor of THE JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND
OTOLOGY.*

DEAR SIR,—The paper by Dr. Edgar Cyriax in the August number of the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOLOGY recalls some observations on the normal subject which I made several years ago and published, as a clinical note, in this JOURNAL for November, 1915.

My contention was that by rotation of the head to either side a swelling (simulating retropharyngeal abscess) could be produced in the pharynx of any person, the swelling being caused by the transverse process of the axis vertebra.

If the head is rotated to the right, the swelling occupies the right half of the posterior pharyngeal wall; if to the left, the left half. The part involved is the wall of the oro-pharynx, just behind the tonsil. The nasopharynx remains unaltered, since the level of this cavity corresponds to the basi-sphenoid and anterior arch of the atlas vertebra.

Movements of rotation of the head take place chiefly at the joints between the atlas and axis vertebræ. While the head and atlas vertebra rotate together, the axis vertebra moves but slightly and, lagging behind it causes the bulging of the pharyngeal wall which I have described as a normal condition, visible in anyone, though naturally more noticeable in those who are of bony and spare build, and whose pharyngeal mucous membrane is thin and atrophic.

Those observations may be readily confirmed, and, in studying any case of supposed malposition of the cervical vertebræ, it is well to bear in mind such fundamental facts regarding the mechanics of the normal cervical spine as I have set forth.

It would be interesting to know whether the swelling, observed by Dr. Dundas Grant, was lateral in position, and whether it disappeared or diminished in size, when the head was rotated towards the affected side.

2, COATES PLACE,

EDINBURGH,

August 20, 1917.

I am,

Yours faithfully,

DOUGLAS GUTHRIE.

To the Editor of THE JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY.

DEAR SIR,—I have for many years recognised and described to my pupils the lateral swellings to which Dr. Guthrie refers, and I can absolutely confirm the excellent description which he gives of them. I may mention that they ought to be very familiar to anyone who makes a laryngoscopic examination on patients who are in bed, as the head has usually to be turned round towards the observer, and the cushion formed by the pre-vertebral muscles projected forwards by the transverse process of the vertebra becomes very obvious.

The swelling observed by me, and described in Dr. Cyriax's paper, is not a lateral one, but mesial, and corresponds to the cushion of Passavant, referred to by some French writers. When present it causes the formation of an isthmus in the middle of the naso-pharynx, the cavity above it being only thoroughly accessible to forceps of the Quinlan type.

LONDON.

DUNDAS GRANT.

NOTES AND QUERIES.

Mr. Macleod Yearsley has been appointed Visiting Aurist to the Jews' Deaf and Dumb Home.

"ADDUCTOR" AND "ABDUCTOR" AGAIN.

We very much regret that on pp. 75 and 76 of the February, 1917, issue of the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, "Adductor" is printed for "Abductor," as follows: On p. 75, in the title of the abstract: on p. 76, in lines 13 (twice) and 16 (once).

Probably our readers have already made this correction for themselves. We are obliged to Dr. L. Gordon Davidson, of Sydney, New South Wales, for drawing our attention to the misprint.

THE EDUCATION OF THE SPECIALIST IN OTO-LARYNGOLOGY.

Wishart ("The Laryngoscope," January, 1916, p. 57) states that Canada is threatened with the burden of a load of ill-trained specialists. In the Universities of McGill and Toronto it is only very recently that the course on otolaryngology has been made clinical instead of didactic. The specialist exists to

give assistance to the general practitioners not to enter into competition with them in any shape or form. The qualifications of the specialist should include: (1) A knowledge of the more important modern languages. (2) A post-graduate position as hospital intern. (3) A year or more in general practice. (4) An internship of at least eighteen months if the choice be oto-laryngology. (5) A year of post-graduate instruction upon (*a*) clinical diagnosis and treatment; (*b*) functional tests; (*c*) bedside work on surgical cases; (*d*) surgical practice on the cadaver; (*e*) minor operations in the out-patients' ward; (*f*) demonstrations and lectures on normal and pathological anatomy, histology, and physiology; (*g*) diagnosis and pathology of labyrinth diseases. Finally, the specialist must become attached to a hospital. Wishart says that few universities are yet equipped to give adequate preparation for specialising. In the future specialisation will not be allowed without such university post-graduate training. We have too many so-called "specialists"—the damaged fruit of commercial post-graduate colleges, which are managed by a board of stockholders for the sake of the "almighty dollar." A man after getting his degree, and with his sheepskin still damp from the signatures of the faculty members, at once goes abroad for special studies, to Paris, London, Vienna, where he takes a few special courses by privat docents, given in a poorly understood foreign language. Six or twelve months later he arrives home—his friends having already been informed by numerous letters of his wonderful attainments abroad—armed with instruments of the latest pattern, declaiming about the most recent methods of treatment of which he is now the only possessor.—J. S. FRASER.

NOISE AND SHELL-SHOCK.

"It is often the case that sudden and unexpected or loud noises aggravate those suffering from shell-shock, and it is interesting in this connection that Homer associated fear with sounds, for he stated, 'terror and consternation at that sound, the mind of Priam felt; erect his hair, bristled his limbs, and with amaze he stood motionless.' The reason for this association is probably connected with the fact that the sense of hearing is the most highly evolutionised, and therefore the least stable of the senses and is thus the most easily disturbed. Also, it may be due in part to the fact that the auditory nerve is closely related to the vestibular nerve, which is again connected with the static sense and with the control of movement. The vestibular nerves, though giving rise to no sensations, are nevertheless closely connected at their roots with the roots of the motor-oculi nerves as well as with other motor centres in the medulla and cerebellum. The auditory nerves are thus correlated and continuously associated with movements, yet there is no knowledge in consciousness that there is a connection between the eyes, the bodily movements, and hearing" (Sir R. ARMSTRONG-JONES, *St. Bartholomew's Hospital Journal*, July, 1917, p. 97).

It is interesting to remember in connection with these remarks that the auditory (acoustic) and vestibular nerves are associated in their end-organs, and not in their central nervous connections. The presumption, therefore, would be that sound of certain kinds may directly stimulate the vestibular end-organs in the semi-circular canals, and in favour of this supposition is the fact that in certain hyperæsthetic states loud sounds may induce vertigo in the patient.

It is possible, in other words, that the *alarm* (using that phrase in its widest psychological meaning) induced by a loud sound may be partly due to impressions conveyed not only through the cochlea, but also through the semi-circular canals.

It is difficult, indeed, in view of the close union of the vestibular and hearing end-organs, to escape from the idea that inasmuch as they lie in close proximity to each other, and indeed in contact with the same body of fluid, so their functions must be similarly united at times.—DAN MCKENZIE.

BOOKS RECEIVED.

Otites et Surdités de Guerre. Par H. Bourgeois & M. Sourdille. Masson et Cie., Paris, 1917.

Operative Surgery of the Nose, Throat, and Ear. Edited by Hanau W. Loeb. Vol. ii. London: Henry Kingston, 1917.

THE
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**LATERAL SINUS DISEASE: THREE CASES ILLUSTRATING
POINTS OF INTEREST.**

BY CAPTAIN ARCHER RYLAND, F.R.C.S.Ed., R.A.M.C.,

Aural Surgeon, Cambridge Hospital, Aldershot.

PRE. R. W.— was admitted to the Cambridge Hospital on July 28 suffering from suppurative otitis media in the left ear. The patient gave a history of left aural discharge of four weeks' duration. Signs of acute mastoid inflammation were present on admission. These signs were more obvious at the region of the mastoid apex, and at the region just in front of the apex. There had been no vomiting and no rigors. Nor was there any direct evidence that could bring the lateral sinus under suspicion. The patient walked up to the hospital. His condition on arrival was good. The temperature was 99·2° F., and the pulse 84. It was anticipated that a simple drainage of the mastoid antrum and involved cells was all that would be necessary.

Two days after admission an operation was performed. A perisinus extradural abscess of fair size was quickly encountered and drained. It was noticed that the pus in this situation was confined under an unusually high pressure. On exposure of the sigmoid wall, it was found to be covered with abundance of soft, recent, and, in certain places, necrotic granulations. After removing these, the wall itself was found to be red and inflamed. The exposed surface of sigmoid wall presented not the usual convex, but a very positive concave appearance. The wall was now opened by longitudinal incision, and a complete absence of blood, or of blood-clot was observed within the lumen. In other words, the vessel in this region was quite empty. Its anterior wall was depressed into a concavity, and lay almost in contact with the posterior wall. Incision at once exposed the white internal surface of the posterior wall. The pressure exerted by the extradural abscess had evidently compressed all contents right out of sigmoid lumen in this particular area. The deep jugular vein was ligatured and divided. The vessel contained no clot.

The sigmoid was now followed out both in an anterior and a posterior direction. In the anterior direction, healthy wall was encountered about 2 cm. above the jugular bulb. In the posterior direction healthy wall was encountered at a distance of about 4·5 cm.

posterior to the mastoid antrum. From both distal and proximal extremities of the lateral sinus thus exposed, septic clot was evacuated. As a result of this procedure, a fairly free hæmorrhage was eventually re-established. It was more copious from the distal extremity. The greatest care was taken to evacuate all *septic* thrombus, though it is certain that a complete removal of all clot present within the lumen was not affected.

The operation proved a prolonged and difficult one, and the bleeding had been not inconsiderable. The tympanic cavity was left untouched. Subsequent events, however, showed that the operative procedure had been sufficiently radical. The cervical incision healed by first intention. The antro-mastoid wound cleaned up rapidly and did well from the first. Convalescence proceeded without a set-back of any kind.

The most noteworthy point of this case was the very striking pressure concavity of the lateral sinus wall, brought about by the condition already detailed. It is a little difficult to understand why this is not a more common occurrence, seeing that the factors which may bring it about are so frequently met with.

Another point is, that omission to follow the clot backwards towards the torcular until its most posterior limit has been reached, does not necessarily mean failure.

The rapid clearing up of sepsis after operation was probably due to frequent "Eusol" irrigation, combined with "Flavine," 1 in 500 used on gauze packing. The sigmoid lumen was kept wide open and was lightly packed twice daily with gauze strips soaked in "Flavine" of the concentration named.

Pte. P—, aged twenty-nine, was admitted to the Cambridge Hospital, on July 14, suffering from acute mastoid disease.

Three months before admission there had been discharge from the right ear, but this had cleared up entirely and the present trouble dated from ten days before admission. On examination of the ear, it was found that there was a large fluctuating mastoid abscess present, and also purulent aural discharge. The abscess was apparently subperiosteal and subtemporal. An operation was decided upon without delay. An extensive subperiosteal and partially subtemporal abscess was incised and drained. An unusually large necrotic fistula through the mastoid cortex, immediately over the situation of the anterior border of the sigmoid sinus was at once identified. Through this orifice pus had burrowed into the superficial planes. The lateral sinus wall, on exposure, was found to be in a condition of phlebitis. Over a small area, the tegmen antri had crumbled, exposing a reddened surface of dura mater.

In this case, both sigmoid sinus and middle cerebral fossa approached into considerably closer relation with the mastoid antrum than is usual. Fortunately the outer mastoid cortex was thin, and broke down early. Convalescence was uninterrupted, and the patient made a complete recovery.

This is a case of well-recognised type, and reveals nothing new. It is recorded now, because it so well illustrates the fact that the course taken by acute infective disease of the middle-ear tract may be, and nearly always is, much more dependent upon anatomical dispositions than upon the nature and virulence of the infection.

Driver W—, aged twenty, was admitted to the Cambridge Hospital on May 13. He complained of pain and discharge from the

right ear, and gave a history of a sudden onset of right aural discharge a few days before admission. On examination, there was found to be profuse aural discharge, with the usual signs of acute mastoiditis.

Operation (Schwartz).—A condition of diffuse suppuration involving the antrum and cells was revealed. Thick pus was evacuated from the mastoid process at the very first removal of bone from the cortex. A precautionary exposure of the lateral sinus wall showed it to be healthy. The following periodic notes record the subsequent history of the case:

May 30: Progress since the operation has been good. The temperature has not been raised above normal for over a week. The wound has been secreting a large quantity of thick greenish pus, necessitating a twice daily dressing. The mastoid sepsis has on the whole, however, been gradually decreasing daily. This evening there was a rise of temperature to 104.3° F., and a faintly marked erythematous rash made its appearance over the front of the chest. An organism of identical appearance with the pneumococcus was to-day recognised in considerable numbers in the direct film.

June 1: The temperature remains of a septic type. No spontaneous nystagmus: no vertigo or vomiting.

June 5: The temperature has maintained its septic character, showing marked rapid oscillations.

Second Operation.—The wound was fully re-opened. An additional posterior incision at right angles to the original one was made, and the mass of granulations overlying the formerly exposed lateral sinus were freely curetted away. A necrotic fistula was now found perforating clean through the anterior wall of the sigmoid sinus. A probe passed through the fistula, down on to a solid intra-sinus clot. At this stage, a resection of the deep jugular vein in the neck above the level of the common facial was effected. There was no thrombus in the vein. The thrombosed sinus was finally dealt with in the usual way.

A specimen of cerebrospinal fluid obtained by lumbar puncture just previous to the operation was reported upon as follows:

"2 ccc. of turbid fluid. Globulin increased in amount. Reducing power (Fehling) somewhat lessened. Centrifugalised deposit: Films show no micro-organisms. Cultures sterile after twenty-four hours."

The report on a subsequent specimen was as follows:

"Fluid markedly turbid and containing flocculi. Microscopically polymorphonuclear leucocytes are present, and also gram + capsulated cocci. The cultures have grown a pure growth of pneumococcus."

The report on the final specimen was as follows:

"Markedly turbid fluid. On standing a large purulent coagulum. Fehling not reduced. Albumen, a thick cloud on boiling. Globulin much increased. Direct films show pus and endothelial cells, and an enormous increase of pneumococci over those formerly present."

The patient died of acute purulent pneumococcal meningitis.

The following are the outstanding points:

(1) The involvement of the lateral sinus after an initial operation that appeared at the time to provide a very free drainage.

(2) The virulent pneumococcal infection of the middle-ear tract and finally of the subarachnoid system.

(3) The clean and complete perforation of the sinus wall.

(4) Subsequent events showed that unfortunately too long a time was allowed to elapse before the second operation was performed.

SOME NEW POINTS IN THE ANATOMY OF THE NASAL SEPTUM, AND THEIR SURGICAL SIGNIFICANCE.¹

By J. L. AYMARD, CAPTAIN, R.A.M.C. (TEMP.),

Surgeon to the Ear, Nose, and Throat Department, The Queen's Hospital for Facial Injuries, Sidcup.

In recent years more particularly, the progress of the anatomy of a part appears to advance concurrently with its surgical or medical importance, and the anatomy of the nasal cavities is no exception.

The existence of two distinct movable joints in the septum does not appear to have been recognised as such, and the distribution of the perichondrium cannot be said to have been either described by the anatomist or understood by the surgeon.

The presence of a permanent vascular arrangement within the septal cartilage has apparently also been overlooked.

The septal cartilage is usually represented as being a perpendicular plate attached behind, below, and above, and is illustrated as presenting a free border covered only by the soft parts extending from the anterior border of the nasal bones forwards and downwards, and embedded between the median borders of the lateral cartilages. In the first place, exception must be taken to the designation of the upper lateral cartilages. They never exist as separate cartilages, neither are they separable except by force from the rest of the septal cartilage. Would it not be far more correct to describe each so-called lateral cartilage as the lamina triangularis, and the vertical cartilage as the lamina perpendicularis of one large cartilage, say the cartilago nasalis major? Prof. Macalister has already described them as the "lateral expansions of the septal cartilage."

CARTILAGO NASALIS MAJOR.

For practical purposes it would be much better to designate landmarks indicating the general position and extent of these cartilages, rather than give dimensions which vary so considerably in each individual case.

The lamina perpendicularis (L.P., Fig. 1) of this cartilage presents four distinct borders.

The posterior border is firmly attached to the anterior edge of the lamina perpendicularis ethmoidalis (L.P.E.), the perichondrium of the former being directly continuous with the periosteum covering the latter, thus forming a strong ligamentous band.

The superior border between i and ii, Fig. 1, and A, Fig. 2, is flattened and grooved to receive the prominence caused by the median junction at the under surface of the nasal bones; the groove is continued forwards, where it widens out to form the lamina triangularis (L.T., Figs. 1 and 2) or so-called lateral cartilages. This plate L.T. is triangular in shape, its base being attached to the anterior edges of the nasal bones and its apex (Fig. 1, iii) extending to the superior angle of the anterior free border. In flat noses the lamina triangularis takes a gentle curve, and in sharp narrow ones a shape corresponding.

The anterior border (Fig. 1, iv) is free and rounded, and can be readily seen through its coverings when the columella is held aside.

¹ Reprinted from the *Journal of Anatomy*, April, 1917.

The inferior border is pear-shaped in section (Fig. 1, vi; also Fig. 2, C) and more oval (Fig. 1, vii, and Fig. 2, B). Where it forms the chondro-maxillary joint with the crista incisiva (Fig. 1, v, and Fig. 2, D) it is flattened and terminates in an obtuse angle.

Surface Markings for Localising the Posterior Border of the Lamina Perpendicularis.—The posterior border of this lamina lies a third of an inch behind the anterior edge of the nasal bones, from which it slopes irregularly downwards and backwards.

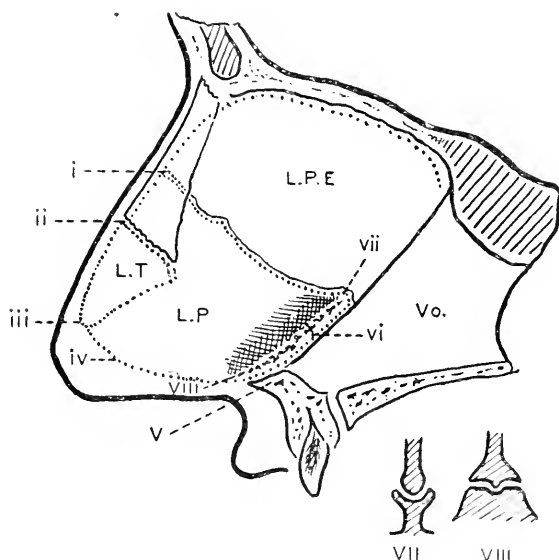


FIG. 1.—Septum of the nose showing the relationships of the septal cartilage.

VII, section across chondro-vomer joint; VIII, section across chondro-maxillary joint.

THE CHONDRO-VOMERAL AND CHONDRO-MAXILLARY JOINTS.

The descriptions given in the leading works of anatomy merely state that the rounded end of the septal cartilage is received into the groove upon the anterior superior edge of the vomer and maxilla. This is correct as far as it goes, but at the same time they offer no proofs that this is not a mere osteo-cartilaginous junction.

The movement permissible at the lower septal joints forms a complete semicircle limited to a right angle each side of the perpendicular.

This, I think, is the only joint in the body permitting such extensive movements, and it appears to be constructed for the purpose. Further, it is, I believe, the only freely movable joint entirely composed of cartilage on the one hand, and a non-cartilage-covered bone on the other. A study of the joint demonstrates the fact that pressure upon the anterior superior surface of the septal cartilage causes it to bend in the direction of its long axis. Pressure upon the anterior inferior border causes the cartilage to bend obliquely upon itself, with a certain amount

of transverse movement across the chondro-maxillary joint, combined with the lateral movement described.

Were it not for this joint, fractures and dislocations of the cartilage

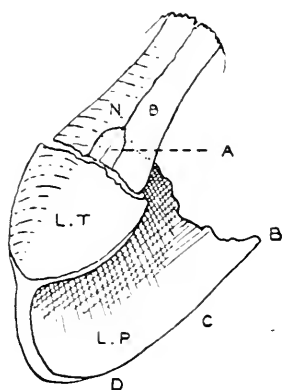


FIG. 2.—The parts of the septal cartilage. (For explanation see text.)

A, B, C, D, sections across the margin of the septal cartilage at the points indicated in Fig. 2 by corresponding letters.

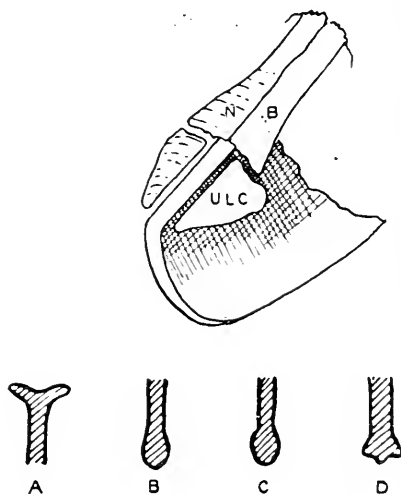


FIG. 3.—The parts of the septal cartilage as described in accepted works.

would obviously be far more frequent than they are. There would be no object in a joint of a similar description with the ethmoid plate, therefore it does not exist.



FIG. 4.

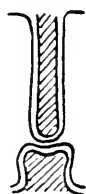


FIG. 5.

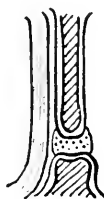


FIG. 6.

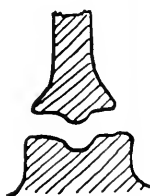


FIG. 7.

FIG. 4.—Transverse section of chondro-vomer joint, with covering membranes removed.

FIG. 5.—Showing the disposition of perichondrium and periosteum at chondro-vomer joint.

FIG. 6.—The same joint showing included fat and the covering of mucous membrane on one side.

FIG. 7.—The articulating surfaces of the chondro-maxillary joint.

The Chondro-vomer Joint (Figs. 4 and 5), as I prefer to term it, is in every sense of the word a very perfect joint constructed for a definite object. The perichondrium and periosteum are in a sense continuous, but there is much more than this to be noted.

In the first place, whatever the condition of the vomer groove may

be—that is to say, though the edges may be irregular or even absent here and there—the pear-shaped lower portion of the cartilage remains fairly constant and the capsular attachments likewise. The definite object of this joint is, without doubt, to allow of free lateral movement when from any cause pressure is applied from above.

A concussion plate is also provided in the shape of a layer of fat (Fig. 6) between the periosteal perichondrial layers. The amount of movement possible, owing to the loose attachment of the perichondrium and periosteum, accounts for the fact that in a deviated septum the articular portion of the cartilage may easily occupy a transverse position across the groove (Fig. 10), forming a projection not infrequently mistaken for a crest.

The Chondro-maxillary Joint.—The portion of the inferior border of the septal cartilage entering into the formation of this joint is usually represented by the anterior third. The cartilage is flattened and pointed (Fig. 7) to rest upon the corresponding junction of the maxillary bones known as the crista incisiva. If this crest is rounded or otherwise shaped the cartilage takes a corresponding form. The corresponding coverings are similar to those of the chondro-vomer joint, but much tougher, thicker, and looser.

The apparent object here is to allow lateral rotation as well as a diagonal lock-gate motion.

The surgical importance of the above is that a blow directed upon the anterior edge of the cartilage bends it vertically upon itself, allowing a position to be taken diagonal to the crista incisiva and thus avoiding fracture. Another point is that, unless the membranous disposition and its nature in this area of the septum is thoroughly understood, the surgeon will find himself in difficulties.

The structures referred to should always be divided carefully with a blunt-pointed bistoury.

THE IMMEDIATE JOINT COVERINGS.

It is generally taught that the perichondrium covering the cartilage and the periosteum covering the vomer are continuous and attached along the crest. Only to a certain extent is this correct. The perichondrial arrangement is somewhat complex.

In the first place, careful investigation shows that the perichondrium does not, as the usual description implies, merely merge into the periosteum. Below the orifices of the chondro-vascular system (Fig. 1, vi) the perichondrium is continued loosely around the cartilage, and is continuous with the perichondrium of the opposite surface (Fig. 5).

The periosteum (Fig. 9), on the other hand, instead of being continuous with the perichondrium, as generally described, merely sends a process upwards to be attached to the perichondrium below the vascular openings, thus loosely covering the vomeral trough (sulcus vomeralis). The perichondrium in a similar manner sends a process downwards to join the periosteum, thus forming a joint ligament.

THE SURGICAL SIGNIFICANCE OF THE POINTS REFERRED TO.

The anatomy of the septal cartilage is principally interesting from the point of view of its partial removal, and here I must protest against the teachings in our leading text-books. Most nasal surgeons will agree

with me that at least 75 per cent. of the cases presenting themselves for obstruction require the removal of only a moderate amount of cartilage and bone. The illustrations referred to advise an eighth of an inch of the anterior pillar of the septum to be left, whereas no experienced surgeon would think of leaving less than a quarter of an inch as a general rule. Further, the removal of the foundation of even this support by chiselling the maxillary crest is recommended freely without reserve and without any warning as to possible ultimate cosmetic effects. In the above case, we should teach the student not to remove a given area, but only just so much cartilage or bone as will give the necessary space for free passage of air or any other purpose.

Most surgeons use Ballenger's knife to remove cartilage, an ingenious but by no means ideal instrument. The usual procedure is to pass the knife along the upper edge of the area to be removed, down the back, and along the lower border. A reference to Figs. 10 and 11 shows the difficulty (with the cartilage lying over, and particularly with three sides cut through) of cutting the cartilage close to the bone—since any downward pressure of the knife only further depresses the free cartilage. The point to remember is, that the piece of cartilage is left possibly lying across the vomer. It being mechanically impossible to remove this portion of the cartilage with Ballenger's knife unless the sides of sulcus vomeralis are absent, I prefer to cut first the front, top, and back, and then remove the lower margin with a small, trough-shaped gouge, having, if necessary, first divided the perichondrium with a blunt bistoury.

I would draw attention to the fact that the vascular system extends to the inferior angle of the antero-inferior margin of the cartilage, and that this blood-supply is not likely to be re-established if once cut off, which is of importance with reference to the pillar of support proposed to be left.

THE SEPTAL COVERINGS.

The perichondrium is very firmly attached to both surfaces of the cartilage, whereas the periosteum is only loosely attached to the bone and readily removed.

This attachment is marked everywhere except within the joint, and is due to the perichondrial processes which extend deep into the cartilage, so that when the membrane is removed these processes are for the most part torn and remain behind.

The periosteum and perichondrium are about equally adherent to the mucous membrane. Over the chondro-ethmoidal junction there is no special attachment, the one membrane merging into the other. Although the perichondrium is described as being divisible into many layers by mechanical means, I have been able to separate two layers.

The mucous membrane covering the septum has been fully described in standard works. I recognise three layers—a superficial, a middle, and an inner layer; between the two latter run the large vessels and nerves. The mucous membrane is closely attached to the perichondrium and periosteum except over the anterior third of the cartilage. In this position the membrane is very loosely attached. This fact should be noted, because it is entirely due to this loose condition in this region that failure so often takes place.

The usual incision for resection is made the full length required at

the start, and cuts down to the cartilage, severing the perichondrium. The difficulty of endeavouring to separate the (in this region) tough mucous membrane from the closely-attached perichondrium is the cause of operative trouble.

It is far better not to incise the perichondrium at first and only to make a sufficient cut to allow the introduction of the elevator used on Watkins Williams' principle. The incision can be enlarged to the full length when the membrane around is free for a good start.

Experts teach that the cartilage be now cut through and the elevator passed in between the same and the perichondrium and raised to the full extent. As a matter of fact, I think this procedure is more apt to take place by accident than design.

I would draw the attention of students to some other special points of importance. In the first place, all serious hæmorrhage can be avoided when operating if the positions of the larger trunks of vessels are remembered.

Just inside the anterior choana, behind its lower internal border, the palatine arteries must be carefully noted, especially when preparing to remove a portion of the crest.

The next group of vessels likely to be injured are those coursing along the vomer in the mucous membrane and in the region of its crest.

Should the mucous membrane be separated into layers (a not uncommon occurrence), it follows that in using the punch forceps these vessels are very likely to be divided between the bone and the punch. The palatine nerve may also be destroyed in a similar manner, thus leading to subsequent trophic changes in the mucous membrane.

THE SIGNIFICANCE OF THE PERICHONDRIAL ATTACHMENT IN RELATION TO THE OPERATION OF SUB-MUCOUS RESECTION.

In all the leading works upon this subject, this operation is *primarily* described as a muco-perichondrial detachment. I say *primarily*, because in one illustration the sub-mucous resection is referred to, and upon the same page it is described as muco-perichondrial, thus greatly confusing the student. It is clearly wrong to describe the operation as a sub-mucous perichondrial one. The illustrations upon this subject show quite correctly the mucous membrane loosely separated outside the speculum, whereas a sub-muco-perichondrium could not be so illustrated.

It is better to imagine the cartilage of the septum to be suspended in a covering (Fig. 5), completely enclosed in front and only opening behind at the ethmoid margin, where it is anatomically continuous with its periosteum.

If this fact be grasped, it will be at once seen that any elevator once entering beneath this covering has no chance of exit except by force.

An elevator passed between the perichondrium and the cartilage and pressed downwards will find its way into the joint round the cartilage and up the opposite side. This fact can be readily proved by experiments.

The perichondrium itself is capable of being split into at least two different layers. Upon the lateral surface of the cartilage it is very

firmly attached, and less so to the mucous membrane; but, once it reaches around the articular surface below the edge of the osseous groove, it is only loosely attached. The real periosteum rolls loosely over this bony edge, where it lines the bony trough (the sulcus vomeralis) and joins the opposite layer. If the cartilage is pushed well over to either side, the condition of the attachment at one time loose and another time tight, is readily seen. A layer of fat is met with between the perichondrium and periosteum, and also between the periosteum and floor of the vomeral groove.

If the cartilage removed from a recent septum be examined it will appear to be destitute of covering, but an incision into it and firm

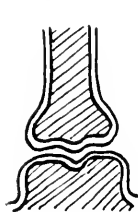


Fig. 8.

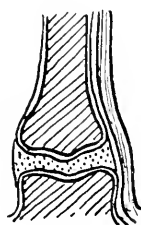


Fig. 9.



Fig. 10.



Fig. 11.

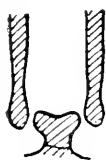


Fig. 12.



Fig. 13.



Fig. 14.



Fig. 15.

FIG. 8.—Section of chondro-maxillary joint showing the arrangement of the perichondrium and periosteum.

FIG. 9.—Another diagrammatic section showing the included layer of fat, the capsule and mucous membrane (on one side).

FIG. 10.—Dislocation of septal cartilage presenting a condition frequently mistaken for a spur of bone.

FIGS. 11, 12, 13, 14.—Types of dislocation at the chondro-vomer joint.

FIG. 15.—Type of chondro-maxillary displacements.

pressure with an elevator will reveal the perichondrium intact. In some instances the perichondrium may be found to have been removed for a short distance on the proximal side of the cartilage, but seldom, if ever, on the distal one.

I am not advocating any attempt to remove the perichondrium intact. I think it is very questionable whether two intact surfaces of perichondrium left behind would serve any useful purpose, much less if they were in a bruised and torn condition.

THE MEMBRANOUS FOLDS OF THE CHONDRO-VOMERAL JOINT.

When passing the elevator downwards, it is a golden rule, upon approaching the joint, to stretch the parts well outwards, or, where considerable deformity exists, to cut the membrane *from behind*

forwards and towards the cartilage with a curved blunt-ended bistoury. In most cases, if the elevator is pressed firmly outwards at this point and force used, the attachments will give way and the elevator pass downwards between the bone and the periosteum.

It must be remembered that, if the cartilage is (for example) leaning over to the left, the attachments on this side will be loose, and it is quite easy to force the elevator, membrane and all, into the joint. It is a good plan, therefore, when dividing the same with a bistoury, to press the cartilage well over to the opposite side to that on which the incision will be made, for by so doing the membranes attached are put upon the stretch.

The membranous folds of the chondro-maxillary joint are for all practical purposes similar, but (as before described) thicker, looser, and tougher.

FRACTURES AND DISLOCATIONS OF THE SEPTAL CARTILAGE.

Although acute conditions of the above are frequently referred to in the text-books, their nature is seldom defined, for very obvious reasons, whereas the chronic conditions of luxation and dislocation are extensively dealt with. Fig. 10 is by no means an uncommon condition; Fig. 11 rare; while Fig. 12 shows a direct dislocation either side of the sulcus vomeralis. I have never seen such a dislocation. The loose condition of the joint coverings allows for extensive displacement, but long before this direct lateral dislocation could take place the cartilage would probably double up. Further, unless the nose be crushed in or the cartilage be torn from the under surface of the nasal bones and the whole margin of the ethmoidal, any sudden dislocation is a mechanical improbability. In Figs. 13 and 14 we notice quite common forms due to the absence of the rim of the sulcus. Fig. 15 is not an uncommon form. The main portion of the cartilage is retained in the vomeral joint, but that over the crista incisiva is dislocated diagonally.

With regard to fractures, I am far more inclined to look to the upper and posterior borders for possible trouble, because they are not provided with movable joints. Sufficient force applied to the anterior portion of the nose must do one of two things—either fracture and dislocate the nasal bones, or depress, dislocate, and tear the upper grooved edge of the cartilage from the under surface of the nasal bones, and in this case it will probably break it off from the lamina ethmoidalis perpendicularis, and thereby deflect the anterior aspect of the nose. In this way only can I account for the fact of a crooked nose without displacement of the nasal bones after an accident.

THE CHONDRO-VASCULAR SYSTEM.

Situated in an irregular line (Fig. 1, vii) will be seen the orifices and branching of the canals forming this complete system. These canals occupy the whole area described as the pear-shaped lower border, and also the portion anterior to this. They contain blood-vessels which arise from the mucous membrane and penetrate the perichondrium. These canals do not in any case communicate with each other, the vessels entering and returning by the same orifice. This vascular system is best studied and demonstrated in the septal cartilage of the sheep, when the septum, devoid of perichondrium, has become nearly dry. It may

be beautifully seen by holding the cartilage before a strong light against a bright white background. In well-developed fresh human subjects the same arrangement can easily be recognised. These vascular canals are very characteristic and distinctive; they never anastomose, they present rounded ends, and seldom, when branched, project beyond the centre of the cartilage. Upon the other hand, single straight canals can frequently be seen passing across the upper portions of the cartilage.

Since writing this article my work as a plastic surgeon at the Cambridge Hospital, Aldershot, has given me an unique opportunity of examining a large number of costal cartilages, and I have no hesitation in saying that they possess a vascular system precisely similar to that described above in the septal cartilage. The system is very plain to the naked eye, and can be easily traced by the presence of blood. I therefore venture to disagree with those anatomists who describe such a condition as mere prolongations of persistent perichondral processes. The only difference I have so far been able to find between the vascular canals in foetal cartilage and the vascular canals in the permanent cartilages referred to, is that in the former the ends of the canals are more pointed and branched, whilst in the latter they are rounded. Injections of these canals produce very interesting conditions, but their description I must leave to another occasion.

SURGICAL IMPORTANCE.

If the coverings of the cartilage are removed upon both sides at the chondro-maxillary joint, the complete internal blood-supply of this thickened piece of cartilage will be found destroyed, a fact which leads to the question as to what eventually becomes of this pillar base which is left by the surgeon for cosmetic purposes.

I have very great pleasure in acknowledging valuable assistance from Prof. Wood Jones, who very kindly prepared illustrations from my rough drawing, and from Dr. Watkins Pitchford of the South African Institute for Medical Research, Johannesburg.

CLINICAL NOTE.

OBLITERATION OF THE CAVITY OF THE ANTRUM AFTER NASAL ANTROSTOMY.

BY DAN MCKENZIE.

NASAL antrostomy—the formation of an opening into the nasal wall of the antrum through the nose—is still on trial, and one of the objections raised to the operation, admittedly partial, is that as it does not enable us to see to the complete removal of the lining of the cavity, the chances of curing the disease are but remote. Again, several years ago there was considerable discussion on the subject of the obliteration of the frontal and other nasal sinuses by fibrous tissue as a result of operation, and it was pointed out at the time and generally agreed to that this desirable result was most probable when the lining of the sinus was cleared out.

I do not for a moment doubt that this, as a rule, is probably correct. But the same agreeable change may follow simple nasal antrostomy, as I have recently found.

The patient was a gentleman, with multiple nasal sinusitis on both sides. Nasal antrostomy was performed, fairly large openings being made on both sides. As he lived in the country, he was instructed in washing out the cavities with a suitable cannula in the usual way. Three months later he returned to say that he thought the openings had closed, and I was disappointed to find on examination that his opinion was correct. Proof-puncture of both sides, however, showed that the antra contained no pus, and I was able, therefore, to assure the patient that, though closed, the suppuration in the cavities had been cured.

Six months after the antral operation he was again anæsthetised in order to have the sphenoidal sinuses opened up and drained, and as he still showed some slight apprehension with regard to the antra, I took the opportunity of reopening both cavities through the nose and of examining them with the finger. To my surprise, fibrous tissue strands could be felt criss-crossing the cavity in all directions and very completely filling it up. Both antra were alike in this respect. I did not disturb the arrangement.

Nasal endoscopy is of the greatest value after antrostomy, as one can watch very comfortably the progress of events after operation. The most usual development is that the edges of the artificial opening become cicatrised and sharp, while the interior is more or less filled up by a pale, œdematous, bulbous mass which secretes more or less mucus or muco-pus, the quantity gradually diminishing, in favourable cases, as time goes on, coincident with a reduction in the size of the mass inside. Examination with a probe proves this mass to be solid, and not semi-liquid or polypoid. The above case is the first in which I have been able to prove complete obliteration by fibrous tissue, and it shows that closure of the antrostomy opening is not necessarily to be regretted.

The case, I should add, was one in which the original suppuration was of short duration, probably not any longer than about six months

SOCIETIES' PROCEEDINGS.

ROYAL SOCIETY OF MEDICINE—LARYNGOLOGICAL SECTION.

February 2, 1917.

President: Mr. T. MARK HOVELL.

Speech without the Use of the Larynx.—E. W. Scripture.—The patient, a girl, aged eighteen, has worn a tracheotomy tube since the age of three. She breathes entirely through the tube; if it is closed or removed she begins to suffocate. With the laryngoscope the walls of the lower pharynx are seen to obscure the larynx. On retching, the larynx is raised into view. Apparently she cannot make air pass through the larynx. She can speak quite distinctly in a faint, almost toneless voice. It is of interest to inquire if the passage through the larynx can be reopened. There seems to be no fundamental reason why this should be

impossible. If it is reopened, can the vocal cords be brought into action? If so, will the patient readily learn to speak normally, or will there be a conflict with the old method?

Apparatus for the Graphic Record of Speech.—Inscriptions of speech are made by the phonautograph method. The person speaks into a mouthpiece. The vibrations and puffs of air travel down a wide tube to a special recorder. The movements of the air are registered by a fine lever on a rapidly revolving blackened cylinder. The records are afterwards varnished.

Speech requires in the first place a supply of air with a difference in pressure before and behind some obstruction. Ordinarily the lung pressure is increased and the obstruction is formed in the larynx or the mouth. The patient shown uses the pharynx instead of the thorax. To produce "t," for example, she places the tip of the tongue against the front of the roof of the mouth in the normal way. Then she contracts the pharynx—as can be seen from outside—and compresses the air. When the tongue contact is released, a "t" is heard. She likewise produces all the occlusives, such as "p," "k," and the fricatives, such as "f," "th," "s," "sh," in a normal manner except for the supply of air. As the amount of air in the pharynx is very small, the sounds become weak in long phrases.

To produce a vowel, a vibrating body is necessary. This she obtains by raising the back of the tongue against the velum palati. When the air is compressed in the pharynx, she allows it to escape by slightly relaxing the tongue-velum contact in such a way that the contact edges vibrate. The tongue-velum contact thus forms a pseudo-glottis. The different vowels are produced by adjusting the mouth cavity.

The patient can even indicate differences of pitch, though in an imperfect way, as in singing "ah-ah-ah-ah" on four notes of an octave.

This girl has never received any instruction in speech, and has evolved this method of talking quite automatically.

MR. HERBERT TILLEY: Dr. Scripture says in his notes: "There seems to be no fundamental reason why this should be impossible," *i. e.* the reopening of the larynx. The case illustrates what is the not uncommon but evil result of doing a high tracheotomy, or, more strictly speaking, a high laryngotomy. This patient seems to have had the tube inserted in the cricoid or thyro-cricoid region, with the usual result—*viz.* excessive formation of granulation tissue followed by cicatrization with eventual blocking of the lumen of the air-way. In University College Hospital there is at the present moment a boy who has been there four months for the treatment of this same condition. Under an anæsthetic we could pass only the finest Lister's urethral bougie from the tracheotomy wound through the larynx. We substituted a low, for the previously high tracheotomy. Laryngofissure was then performed. In the sub-glottic region I found a passage admitting only the small steel bougie. We dissected out some fibrous tissue, and then inserted a small intubation tube, leaving in also the low tracheotomy tube. The child was then able to breathe through the tracheotomy tube as well as through the intubation tube: the intubation tube has now been in, on and off, for four months. We have dilated the stricture so that it is now possible to insert a full-sized intubation tube, and to dispense with the tracheotomy tube for increasing periods of time. If we leave out the intubation tube for three days the stridor recommences and we have to re-intubate. I think we shall be able to continue with the intubation tube until the child

has grown a little more, and then dispense with it altogether. If not, the question will arise as to whether we can turn in some skin flaps or graft the narrowed area of the laryngotracheal region. Perhaps Dr. Scripture's patient has a narrow stricture of the subglottic region, and as she has had it for fifteen years it will mean that whoever treats the condition must be persevering, for it will probably occupy many months. Examination should be made by the direct method, to see what the glottic and subglottic regions are like, and then explore from below to ascertain if there is any passage from the trachea through the subglottic region into the lower throat. It may be necessary to split the larynx and cricoid, to remove any obstructive or redundant masses of connective tissue, and to determine the possibility of either dilating the stricture by intubation tubes or by instituting some plastic operation which shall prevent future narrowing of the air-way. My hospital patient has a good voice when the intubation tube is removed.

Dr. W. HILL: It is a difficult matter to undertake a case such as that described by Mr. Tilley. The treatment may extend over two years, or even four, and the result is often disappointing. In one of my cases, in spite of the use of an intubation tube for six months, the tracheotomy tube had to be re-inserted after all apparatus had been dispensed with for a few weeks, and I gave the case up in despair, as far as dilating up the strictured larynx was concerned. I am aware, however, that some good results have been recorded in such conditions. This patient is a child, and if the larynx grows and one can get a wider passage, the functional disability may possibly be reduced to a minimum.

Dr. W. H. KELSON: Why is it said that apparently no air passes through the larynx? The voice she has probably indicates that a very little air does pass that way. Some years ago I showed here the case of a man who had cut his throat above the larynx, causing a big aperture, and in that case the man could not speak at all when the opening was exposed. But when it was covered with the hand or with a handkerchief he could speak well, showing that the larynx played a minor part in the act of speaking.

Dr. SCRIPTURE (in reply): The patient cannot get air through the larynx. She collects air in the back of the pharynx and then squeezes it out with the muscles of the neck. When the tube is closed she begins to suffocate.

The Relation of Peri-dental Gingivitis to Vincent's Angina.—
Frank E. Taylor and W. H. McKinstry.—At the Queen Alexandra Military Hospital, during the last few months, we have bacteriologically examined nearly 300 cases of fuso-spirillary infection of the mouth, and have abundantly confirmed previous findings of the constant presence of these organisms in all forms of ulcero-membranous inflammation of the mouth, either alone, or associated with various forms of cocci, bacilli, and leptothrices.

In addition to the diffuse ulcero-membranous gingivitis previously described by Vincent and others, which is frequently found in association with Vincent's angina, there is also frequently met with a more restricted infection of the gums with these fusiform and spirillary organisms, in which the lesions are limited to those parts of the gums which are in immediate contact with the necks of the teeth. This condition constitutes, we believe, a distinct clinical entity, and may accurately be designated "fuso-spirillary peri-dental or marginal gingivitis"—a con-

dition which was fully named and described by us in a paper read before the Odontological Section of this Society on November 27, 1916.¹

In addition to its prevalence, this affection is of additional interest and importance in that it is often confused with pyorrhœa alveolaris, although it differs from this condition in the absence of pus and pus-pockets. Further, the treatment, course, duration, and prognosis of these two affections are essentially different.

In our earlier examinations of cases of Vincent's angina the investigations were restricted to the ulcero-membranous lesions of the pharynx, and to the differential diagnosis of the condition from other ulcerative membranous infections, particularly diphtheria and syphilis. Later the ulcero-membranous lesions were found not to be confined to the pharynx, and many cases of fuso-spirillary gingivitis were observed, often associated with the typical Vincent's angina. It is, however, the restricted peri-dental or marginal gingivitis which we have particularly found associated with Vincent's angina, although in a few cases the accompanying gingivitis was of a more diffuse character.

Since our attention was first directed to this association of peri-dental gingivitis and Vincent's angina, we have made a systematic examination of the gums in seventy cases of Vincent's angina, and in every case, without a single exception, we have found the gums to be affected, the condition in the great majority of these cases being a localised peri-dental or marginal gingivitis. Conversely, out of 150 cases of fuso-spirillary gingivitis, the characteristic lesions of Vincent's angina have been present in the pharynx or tonsil in seventy cases. In all these cases the clinical findings have been confirmed by careful bacteriological examination.

An investigation of the histories of these cases shows the same sequence of events in them all—namely, that the gums were always infected first, and that the sore throat was the more recent condition, having been infected, it would seem, from the gums. In many cases the patients themselves would make no complaint of the gums, but on inquiry it would be found that the gums had been sore and bled more or less freely whenever an attempt was made to use a toothbrush or clean the teeth. This condition of the gums may have been present for days, weeks, or even months, and in a few cases years, before infection of the tonsil or pharynx supervened. In some of these chronic cases of peri-dental gingivitis the patients had repeatedly suffered from attacks of sore throat, and examination in these cases usually revealed evidences of old ulceration of the tonsil or pharynx, with loss of tissue, deep crater-like depressions in these organs being often found.

The histories of the cases keep repeating the same sequence of events with monotonous regularity—first there are bleeding sore gums, which may, or may not, have been diagnosed as pyorrhœa, and which may have been present for some considerable time, and then the throat becomes affected and the typical ulcero-membranous pharyngitis and tonsillitis of Vincent's angina is seen. The diagnosis is confirmed by finding the typical organisms in both conditions.

Our experience has been confined to adults, but Vincent's angina is also seen in children, and it would be interesting to learn if the same frequency of peri-dental gingivitis is observed in association with Vincent's angina in children, and whether the same sequence of events, viz. the peri-dental gingivitis preceding the Vincent's angina, also occurs in them.

¹ *Proceedings*, 1916-17, x (Sect. Odont.), p. 8.

As the result of our investigations we suggest that when a patient complains of a sore throat which presents the characters of Vincent's angina, it is essential to examine carefully the tooth-margins for evidence of peri-dental gingivitis, or conditions diagnosed as pyorrhea, and that smears be made from both sources and examined microscopically for the detection of the causal micro-organisms. When these are found to be present the peri-dental gingivitis should be adequately treated as well as the Vincent's angina, otherwise the condition is likely to persist indefinitely, or to cause repeated recurrences of the sore throat.

Our thanks are due to Mr. J. C. Potter, Laryngologist to the Queen Alexandra Military Hospital, for sending us many of the cases, and confirming our results, and to the Commanding Officer, Surgeon-General J. Dallas Edge, C.B., A.M.S., for permission to publish them.

Dr. DAN McKENZIE: The association of peri-dental gingivitis and Vincent's angina seems to add one more lesion to the number already described in which this organism is present in large numbers. If Dr. Wingrave had been present he would have been able to discuss the matter, as he has devoted attention to it for many years. He has also found the organism of Vincent's angina in ear discharges, and in one or two brain abscesses. In a case I reported here the organism was found by him in the cellulitis of the neck following upon an operation for tonsillitis and adenoids, which proved fatal. Though it is present in large numbers in these lesions I do not think that its pathogenicity has yet actually been established. It is found normally in the mouth, and the question is as to what is responsible for the conversion of the organism from a harmless parasite into a factor in a troublesome lesion. Dr. Wingrave believes both the fusiform organism and the spirillum to be modifications of one species.

Dr. WATSON-WILLIAMS: May a too free brushing of the teeth with a stiff brush cause an infection of the gums by producing abrasions? A number of cases of pyorrhea alveolaris are possibly due to this cause. Less vigorous brushing is often desirable, whereas the contrary is frequently urged.

Dr. W. HILL: How many typical tonsillar lesions has Dr. Taylor seen associated with this special type of Vincent's disease? We do not often see it. Several of my cases seen before the war were soldiers living in camps.

Mr. O'MALLEY: Has Dr. Taylor made any sections showing cellular changes in the tissue due to the activity of the organism mentioned? I have removed tonsils in which a similar condition existed, and the report I received was that the tissue changes showed an excessive amount of lymphoid cells, a small-celled exudation, in the parts surrounding the ulcerated areas.

Mr. FRANK TAYLOR (in reply): We have seen more than 300 cases of infection by these organisms, and in every case, in our experience, the lesion has been limited to the buccal cavity. With regard to the presence of these organisms in a healthy mouth, one is tempted to ask, What is a healthy mouth? Even in well-groomed mouths one occasionally sees fusiform bacilli and spirochaetes, but the microscopic picture of the film from such a condition is quite different from that in which there is an infection. In the former case the films require much searching to detect the organisms, while in the latter there are masses of them. There is a difference of opinion as to whether these are two distinct organisms, or whether they are different stages of the same. We have actually found evidence of infection in toothbrushes, and in several

cases we have associated the infection with the use of such brushes. In the last few months we have seen about 150 cases of Vincent's angina. We have not had the opportunity of making sections of the gum tissue, because the effect is the reverse of a hypertrophy, so that there has been no redundancy of tissue to remove.

Laryngofissure for Epithelioma of the Larynx, shown at Intervals of Three and a Quarter Years, Two and a Quarter Years, Ten Months, and Three Months after Operation.—Sir StClair Thomson.—CASE 1.—Laryngofissure three years after operation. Male, now aged sixty-one, had been hoarse for twelve months when he presented himself on October 17, 1913, with a cupped growth occupying the posterior half of the right vocal cord. The cord moved freely. The Wassermann reaction was negative, and there were no tubercle bacilli in the sputum. The projecting portion of growth was removed by the indirect method with Mackenzie's forceps, and reported to be an undoubted squamous-celled carcinoma. November 10, 1913: Usual laryngofissure; tracheotomy tube removed at end of operation. Microscopic examination revealed structure of typical squamous epithelioma, not invading the muscle planes and showing a margin of healthy tissue all round. The patient's excellent voice is remarkable.

CASE 2.—Male, now aged seventy-one. This gentleman has already been examined by the Section three times. He was first shown on November 6, 1914, before operation, with the whole of the left cord replaced by a red, knobby, ulcerating infiltration. The cord moved well. The infiltration was not suitable for removing a portion for microscopic examination, and the diagnosis therefore depended entirely on the naked-eye appearances and exclusion of other possibilities. It will be remembered that the microscopic examination of the growth, removed by a first laryngofissure on November 12, 1914, suggested that the growth had spread close up to the line of excision in the posterior subglottic region. A second laryngofissure was therefore performed on November 20 (*i. e.* a week after the first) and the patient was shown to the Section a fortnight later (*viz.* December 4, 1914). The tracheotomy tube was removed at the end of the operation on each occasion, and, as will be seen by the dates of his appearance before the Section, his recovery each time was rapid. He was again exhibited before the Section for a third time on November 5, 1915.¹ The patient has not seen for a year, but when last inspected he had an excellent voice and no trace of recurrence.

CASE 3.—Male, aged sixty-eight, was sent to me by Mr. Johnson Taylor, of Norwich, who had diagnosed malignant disease of the larynx. The anterior four-fifths of the vocal cord were replaced by an ulcerating, raised, indolent, pale pink infiltration, slightly white in the centre. The cord moved freely. April 4, 1916: The usual laryngofissure was carried out. The operation was practically bloodless and no vessels were tied from the beginning to the end of the operation. It occupied one hour. The tracheotomy tube was removed before the patient left the table. He was sitting up reading the paper in bed the same evening, and next day was out of bed and eating solid food. The microscopic examination revealed an undoubted epithelioma and that the incision was well clear of the growth.

CASE 4.—Male, aged fifty-seven and a half. The history of the

¹ JOURN. OF LARYNGOL., RHINOL., AND OTOL., vol. xxxi, p. 46.

onset of this patient's trouble is very interesting. He consulted Dr. W. R. Gibson, in Madras, who found a "papilloma" between the anterior ends of vocal cords together with slight ulceration of the right vocal cord. This papilloma was about the size of a green pea. The diagnosis lay between papilloma and malignancy. The patient was advised to return to England at once for advice and possible operation. *En route*, about three weeks before coming under observation, he had an attack of acute tonsillitis, with much pharyngeal straining and his voice suddenly became "perfectly all right." About this time he brought up some blood on one occasion, but is not aware of having ever coughed up anything special. The patient was referred to me by Mr. G. Jackson, of Plymouth. On October 12, 1916, he presented himself with an almost natural voice, yet it was found that the anterior two-thirds of the right cord were occupied by a red, beefy, abraded, shallow infiltration. The cord moved freely and the condition was not suitable for removing a portion for examination. The diagnosis, therefore, rested entirely on clinical appearances and the exclusion of other factors. October 13, 1916: The usual laryngofissure was carried out. The tracheotomy tube was removed at the end of the operation. Patient was sitting out of bed and eating solid food the next day. He left the nursing home at the end of twelve days. The patient has not been seen since, and, therefore, the present condition cannot be reported on.

Dr. WATSON-WILLIAMS: The results in these cases are excellent. In the operation for laryngofissure I consider the preliminary injection of cocaine, before making the incision into the larynx, very useful in abolishing the cough reflex which may cause so much inconvenience. Dr. Irwin Moore has recently introduced improved or new instruments, such as the new saw and shears for dividing the cricoid, etc. Amongst Sir StClair Thomson's cases we find one where there is an apparent growth with appearances suggesting innocency, and in an unusual situation for a malignant growth of the larynx—namely, in the anterior commissure. Hence we ought to reconsider the view which had been put forward, that if the anterior third of the vocal cord is occupied by a growth it is far less suspicious of malignancy than if it is in the posterior half. It does not seem that location is a guide as to the character of a growth.

Dr. D. R. PATERSON: The whole operation, as carried out by Sir StClair Thomson, is a very satisfactory procedure. It has been much simplified in technique, and altogether it is one which is more desirable than it was formerly. One of the points upon which Sir StClair appears to lay stress is that it is a practically bloodless operation on account of the use of local anæsthesia. Of course, he has been fortunate in getting the cases at so early a stage, and the lesson these cases teach is that we should try to educate the profession generally not to allow cases of hoarseness to run on in the way they are permitted to do, and that hoarseness may indicate a serious condition, which the sooner it is tackled the better.

Mr. BADGEREW: I have seen a number of cases upon which Sir StClair Thomson has operated in the last eighteen months, and three points particularly impressed me: (1) The operation is practically bloodless; (2) there is little, if any, shock—the patient is well the same evening, and next day is sitting up; (3) the voice is exceedingly good. I ask whether Sir StClair expects, in the case operated upon three months ago, a better voice than the patient has now, which I consider very good.

Dr. JOBSON HORNE: In commenting on the fact stated in the notes

that in all four cases the affected cord "moved well" or "moved freely" at the time the patient came under observation, may I say that is not in accordance with general experience in cases of malignant disease of the larynx. It shows that the growth has not infiltrated the subjacent intrinsic muscles, and it also shows that an early diagnosis is everything in obtaining a good result from the operation.

Dr. W. HILL: Everything goes smoothly, and there is very little bleeding in this operation, as carried out by Sir StClair Thomson. It appears to be followed by little shock if not done with violence. Much of his success is probably due to the fact that he does not put the patients in the Butlin posture afterwards, but makes them sit up at once. Butlin's posture does not, as the originator hoped it would, prevent the septic secretions going down into the lungs, and if the patient has a weak heart, there may ensue cedema of the lungs, and in one in three cases death has resulted. In Sir StClair Thomson's cases there are no complications, so far as I can ascertain. These cases of his were most suitable for operation—the lesion not too large, but just large enough for easy diagnosis. In some of my cases, when I first saw them, invasion of the pharynx, and occasionally of the œsophagus and the mediastinal glands also had occurred, so that operation had no chance. Though I do not depreciate the value of his technique, yet I think his after-treatment is even more important.

Mr. FRANK ROSE: I should like to confirm Dr. Hill's remarks about the attitude in which these patients should be placed after the operation. I have tried keeping the patient lying down with the head very low: I have also adopted the method of making the patient sit up immediately after the operation, and I have no doubt that the last named is the better method—he is more comfortable, and gets better more rapidly.

Dr. DAN MCKENZIE: I ask Sir StClair, as I have asked on previous occasions, as to the advisability of removing a piece of the growth before operating. In one of these cases a projecting portion of growth was removed, but in the other cases no portion was removed because "the infiltration was not suitable." I would ask when it is suitable, and how we are to tell.

Sir STCLAIR THOMSON (in reply): It is striking that not one of the four cases shown this afternoon had fixation of the cord: it is very important to remember that. Yet I had a case in which flagging of the cord was the only suspicious symptom. It does not always mean that the case is advanced: the case I have in mind was in an early stage. In two of to-day's cases the growth was on the anterior four-fifths of the cord. The old idea that malignant disease selects by preference the posterior aspect of the glottis is, in my experience, quite a mistake. Perhaps the growths in half my cases were more in the anterior than in the posterior half of the larynx. With regard to previous removal of a portion for examination, in one case where a piece was projecting there seemed no reason why I should not make assurance doubly sure, but this is not my usual practice; one might nick a piece of mucous membrane, the effect of which might be to stir up the disease. Of course part of the success has been due to the fact that I know when to hold my hand. That is shown in the case which Mr. Trotter will tell you of presently. I saw it was not suitable for laryngofissure, so I turned it over to him. Though Dr. Hill has seen some of my most favourable cases, I have had others which have been troublesome. In one or two I had to split the cricoid as well as the thyroid, and these are the more serious cases, because we get recurrences among

them, though some have remained indefinitely without recurrence. Mr. Badgerow spoke of the absence of shock, and I have asked myself why. I show you a typical chart. The patients are operated upon at 9 in the morning, and at 6 p.m. the same day they are sitting up in bed reading the evening paper. Nearly all are out of bed the next day. I think this absence of shock is due to the use of cocaine before the operation. The skin is injected with eudrenine beforehand, and for some years past I have also made an intratracheal injection of cocaine before doing the tracheotomy: it seems to abolish the shock, and there is no coughing. It makes it as quiet and bloodless an operation as septum resection. Some of the patients have left London again within a fortnight. I do not know how I came to adopt this position for patients, because twenty years ago the teaching of Butlin, which was largely followed, was to put the patient low in the bed, and he was not allowed to lift his head, so that he lay there slobbering in blood and mucus, which he was unable to cough up, and the blood and mucus were sucked down into the lung. My first experience of the sitting-up posture was in a German in whom the anæsthetic was not given elegantly, and blood got into the base of the lung and produced consolidation. He refused to lie down after the operation, and he got well because he sat up and spat the blood up! The only improvements I feel I have made are merely simplifications. Dr. Irwin Moore, to whom I am deeply indebted for details connected with these operations, injects the patients' skin an hour before the operation at 9. This is one of the reasons why the operation is so bloodless. It is a question of having all the preliminaries well done, not hurrying the operation, and taking care to restrict beforehand any indulgence in tobacco and alcohol, and having the blood-pressure determined. One man thus operated upon had double aortic trouble, albuminuria and cirrhosis of the liver, yet his operation went as smoothly as that in any other case: he was thoroughly prepared for five days beforehand in a nursing home. We occasionally meet with a growth which is semi-pedunculated. The second patient was a case of the kind. I have published a case in which the patient came into my study with such a pedunculated little "currant" growth of one vocal cord, so simple looking that on the spot I lifted it off with Mackenz'e's forceps, but when the report was that it was epithelioma, I did laryngofissure. In another case the patient came to the out-patient room with a pedunculated growth, which I regarded as malignant. I took it off and it proved so, and I did laryngofissure, but what we then removed proved to have no cancerous elements in it at all. This shows how superficial some of these early cases may be. But most of the cases I have had have been those in which the cord was simply infiltrated, just as it might be by a syphilitic deposit, and preliminary removal of a portion for microscopical examination would be impossible. You would have to take out a piece right through the middle in order to get a satisfactory microscopical examination.

Extrinsic Cancer of the Larynx Two and a Half Years after Operation through the Side of the Neck.—Wilfred Trotter and Sir StClair Thomson.—G. H.—, aged fifty-eight, presented himself King's College Hospital on February 24, 1914, with a reddish, slightly cauliflower growth of the left aryepiglottic fold, well limited and only extending a little way down towards the pyriform fossa. The Wassermann reaction was negative. Under cocaine a good portion of the growth

was removed by the indirect method and reported to be a squamous-celled carcinoma. One gland was felt under the sternomastoid, just behind the left angle of the jaw. The case was transferred to Mr. Trotter, at University College Hospital.

First operation, March 31, 1914: Glands removed from the left side of the neck and found to be reaching from the base of the skull to below the clavicle. The sternomastoid was removed with the glands. The thoracic duct was cut and ligatured. This was followed by leakage of chyle into the wound, which was a long time in healing.

Second operation, June 9, 1914: A somewhat low tracheotomy was done. The larynx was approached through the old wound in the neck. The left ala of the thyroid cartilage was removed. Growth was found to be limited to the left aryepiglottic fold and about the size of a threepenny-piece. This was removed with the clear area of a third of an inch all round. The pharynx was sutured with catgut and a drainage tube inserted. The tracheotomy tube was left in for two days. The patient was discharged from hospital on July 3.

Although subject for many years to chronic bronchitis, and a heavy smoker, the patient remains well, with a good rough voice. In spite of the removal of the left arytenoid and left thyroid cartilage, it is remarkable that there is no glottic stenosis. There is a good fixed cicatricial band on the left side, which acts as a vocal cord.

Mr. W. G. HOWARTH: I have operated upon one or two of these cases by Mr. Trotter's method, as he described it in his College of Surgeons lectures. In some cases the growth has been too high or too low for my ability. I would ask Mr. Trotter how he deals with the cases in which the growths are in the pharyngeal wall, up to the angle of the jaw; whether he does a snipping of the jaw and a turning up of the ramus, or whether he has some other method of getting at them? How does he reach the growth when it extends downwards behind the pyriform fossa and deeper down on the edge of the œsophagus?

Dr. WATSON-WILLIAMS: Is Mr. Trotter in the habit of removing the sterno-mastoid with the glands? And, in removing the ala, was the incision carried sufficiently high to divide the superior laryngeal nerve going beneath the ala on that side? If one can preserve that nerve, it is very helpful, because one of the greatest dangers in connection with all these laryngeal operations is the loss of cough reflex. That is one of the reasons we remove our tracheotomy tube after laryngofissure, and why Sir StClair Thomson's patients did well when sitting up, because they had the best chance of responding to the calls of the superior laryngeal nerve. I show a rough drawing of a case in which there was a malignant growth which appeared to be in the back of the left arytenoid. To approach it from the front by laryngofissure would have made it difficult to deal with the posterior aspect of the arytenoid, especially as the growth extended downwards to the back of the cricoid, so I approached it by opening the pharynx laterally. I got sufficient space by exposing the inferior constrictor and making an incision from below the level of the upper border of the thyroid ala to nearly the lower border, and dragging the thyroid ala forcibly forwards, so as to get some rotation of the larynx. As intratracheal anæsthesia was used no tracheotomy tube was needed. Blood was prevented from getting into the trachea or larynx from the occlusion by the tracheal tube. In this way the left arytenoid was removed *in toto*, and the back of the cricoid cleared. The ala of the thyroid cartilage was intact, and hence there was no chance of

subsequent falling in laterally, and, more important, the limited incision left the superior and external laryngeal nerves intact.

Sir STCLAIR THOMSON: I suppose it was inevitable, but I notice that there was a lapse of nearly four months between the diagnosis of the nature of the case and the removal of the disease. Mr. Trotter removed the glands, leaving the other operation till later. I suppose it was due to the leakage of chyle: otherwise, I take it, he would push from one procedure to the other as soon as possible. It was a great surprise to me that only one gland was felt under the sternomastoid, yet at the operation it was found that the glands reached from the base of the skull to the clavicle. Mr. Trotter said other cases promised well: I remember one which promised best of all, and I forget why, but the patient suddenly died. Is the shock more marked in these cases after this extreme dissection? And is it a warning which should put us on our guard? The whole of one-half of the thyroid cartilage was removed on one side, and the left ala was removed. There is no stenosis. In some of my laryngofissures, where I had to take out the whole of one vocal cord, and perhaps three-fifths of the other, there was some stenosis. Formerly the patient could bicycle, and run upstairs, but after the operation he could not.

Mr. WILFRED TROTTER (in reply): In reference to the situation of the growth in relation to the incision when it is approached by this transthyroid operation, I may first remind you that normally we remove the ala of the thyroid, and then usually the great cornu of the hyoid as well. If that does not give enough room upwards, I divide the jaw also, though where this is necessary it is very improbable that the case would be cured by operation. When these growths get beyond a certain size, although it is technically possible to remove them and the result looks encouraging, they almost always recur. When a primary growth demands some procedure which is unusually heroic the prospect of cure is not generally good enough to recompense the patient for the discomforts of the operation and convalescence. Hence it is unusual for me to divide the jaw after removing the thyroid ala. There is no difficulty in obtaining increased access downwards. Free division of the infrahyoid and sternomastoid muscles with removal of the lateral lobe of the thyroid gland give access to the œsophagus as far down as the clavicle. With regard to extensive operations, the subject of removal of glands is on an entirely different footing. I am not at all alarmed by extensive gland infection, provided the glands remain isolated, and are not fixed to surrounding structures. Under such circumstances, we can almost guarantee a cure if we do an operation which is sufficiently drastic. The cases must be divided into two groups: The first group includes those cases in which the glands are not palpable in this the ordinary operation is done without removal of the sternomastoid. The second group includes those cases in which the glands are palpable, and here we divide the sternomastoid and jugular vein close to the clavicle and remove the glands, fat, connective tissue, muscle, and vein in one mass up to the skull. This case had one of the most extensive glandular involvements I have ever seen, but owing to the fat muscular neck it was practically impossible to detect the condition. We had even to divide the thoracic duct, in order properly to clear the lower end of the posterior triangle, and yet there is complete freedom from any evidence of glandular recurrence. As to dividing the superior laryngeal nerve, this is not usually important since we are usually about to remove the area to which the nerve is distributed. In a purely exploratory operation the nerve of course should be preserved

until we know whether a radical excision of the growth is possible. With regard to rotating the larynx, I have done that several times in exploratory operations on the epilaryngeal region, but it gives a less satisfactory access to the region in question, and I see no objection to removing the ala of the thyroid; it does not cause subsequent stenosis, and it gives admirable access to the upper larynx. With reference to the dangers of the operation in comparison with those of laryngofissure, the difference is a very obvious fact of experience, and it is due to the fact that these epilaryngeal tumours are, technically, growths of the pharynx, not of the larynx. As long as we keep inside the larynx, we have nothing to do with such organisms as we heard of earlier in the meeting, the fusiform bacillus and the spirochaetes of the mouth; but when the pharynx is encroached upon by the operation, they have always to be reckoned with and to be dreaded. Any wound involving the pharynx or oesophagus is liable to a sloughing infection which very small defects of technique may render extremely dangerous or wholly uncontrollable. The merest scratch of the epithelium of the pharynx leads, as is well known, to the formation of a slough. In laryngofissure, there being no implication of the pharynx, it is not necessary to take any *special* precautions against sepsis, whereas in operations done on the pharynx almost the whole procedure is concerned with protection against the effects of the peculiarly virulent local types of infection. The special dangers of the pharyngeal infections are well seen in an operation apparently so simple as the removal of a pharyngeal pouch. If the closure of the gap left by the excision of the sac is not such as to render leakage impossible, there is the gravest risk of very serious and even fatal sloughing cellulitis and mediastinitis. Such forms of cellulitis spread rapidly, and often without much external evidence, and even if the patient survive the immediate danger, are particularly apt to cause secondary hæmorrhage.

(*To be continued.*)

THE AMERICAN LARYNGOLOGICAL, RHINOLOGICAL, AND OTOLOGICAL SOCIETY.

Meeting at Chicago, June 15 and 16, 1915.

(*Continued from p. 233.*)

Report of an Unsuccessful Labyrinthectomy for Relief of Distressing Tinnitus Aurium.—Arthur E. Duel.—Tinnitus aurium of such distressing character as to produce insanity, or to drive the sufferer to suicide, is, fortunately, a rare occurrence. The occasional case, in which every effort has failed, and where sedatives have become useless, except for the immediate time being, present as sad a spectacle as the most hopeless alien. The few cases that have been reported in which major operations, like division of the auditory nerve or destruction of the labyrinth, have been tried for their relief, have met with so little success that no one would be tempted to undertake another, except under great stress of circumstance, or some peculiar hopeful prospect, as in the case recorded.

The patient, a woman, aged sixty, married, had slight deafness

following typhoid fever at the age of eighteen. At the age of thirty-five she first noticed noises in the head, described as escaping steam. Hearing became gradually impaired, and the noises persisted. She was variously treated by different specialists, without relief. She finally came under the observation of Dr. Fielding O. Lewis, of Philadelphia, in 1912. At that time she could hear slightly a watch in close contact with the left ear, and a whisper at about six inches. Local measures failed to improve the condition. She now complained of a monotonous humming around the outside of her head, with intervals of a thumping sensation on the right side of the head. The division of adhesions about the ossicles of the right ear, lumbar puncture, ossiculectomy of right ear, all gave but temporary relief, the tinnitus becoming more and more distressing, necessitating the administration of small doses of morphine. Destruction of hearing on the right side was suggested, but consultants advised against this procedure. Dr. Ducl was then called in consultation. After noting all the necessary tests, and after discussing the problem of the possible outcome, it was decided to ablate the right labyrinth. A complete labyrinthectomy utterly failed to influence the tinnitus. The special feature of the case which caused its being placed on record, was the fact that three months after the labyrinthectomy, Dr. Lewis found that the patient still had hearing on that side. The tinnitus was no better. The most carefully conducted tests made by Dr. Ducl confirmed this unusual finding.

Six months after the first operation a second was performed. Just before operation it was again demonstrated that the patient could repeat words shouted in the operated side, the unoperated side being stopped by a noise apparatus. At this operation the bone wax, which had been employed at the first operation to stop the flow of cerebro-spinal fluid, was removed from the cochlear cavity, which was apparently clear of any vestige of the cochlear apparatus. Thorough enurettage of the cochlear cavity was performed, and the vestibula, which was entered from behind, and the ampullae of the semicircular canals were destroyed. No bone wax was used on this occasion. The wound healed and was dry for several months at the time of the report.

The important phenomenon observed in this case might cause one to question the theory of Helmholtz with reference to functions of the labyrinth. Does it support that of Shambaugh? At any rate it should stimulate further investigations of the physiology of sound perception.

Dr. GEORGE E. SHAMBAUGH said that the first question of importance in this case was to determine the probable cause of the ear trouble. From the history of the case alone, deafness coming on insidiously in middle life, associated with annoying tinnitus, it would appear most likely to be one of otosclerosis. This at once offered a probable explanation for the most interesting feature, namely, that the patient appeared to hear in an ear where the cochlea had been completely destroyed. The explanation that suggested itself was this. In otosclerosis the symptom of paracusis willisi was usually very marked. In these cases it was not unusual for a patient who had great difficulty in hearing the voice, to find that in the presence of a noise, as, for example, on a railroad train, he could hear even better than a normal hearing individual. Now in the case here reported, where the cochlea in one ear had been destroyed, and a noise apparatus was applied to the opposite ear, it seemed not unlikely that through the phenomena of this paracusis willisi, the patient might be able to hear even where no

hearing could be detected when the same test was applied to a normal ear.

The generally accepted view was that sound perception takes place exclusively in the cochlea. If this be true, then an injury, even less extensive than in this case, it would seem, must result in a total destruction of hearing in that ear. If it be true that the patient did actually hear in the operated ear, he believed it must be accepted that the perception took place in the vestibular apparatus. He did not believe that any theory of sound perception which placed this function in the cochlea would account for hearing in an ear which had been subjected to the operation performed by Dr. Duel.

The annoyance from tinnitus aurium was much greater in some cases than in others. Some of this difference was to be accounted for by the difference in the general nervous make-up of individuals. A subjective noise which would cause only moderate annoyance to one person would in another more nervous individual almost drive to suicide.

Dr. GEORGE W. MACKENZIE thought it unfortunate that careful tests were not made before anything was done, as it might then have been determined whether the lesion was in the conducting or the perceptive apparatus. It was possible in nerve lesions to have tinnitus aurium. Two cases had been reported eight years ago, in the *Wiener Klin. Woch.*, by Dr. Alice V. MacKenzie, which were of syphilitic origin. He suggested that in Dr. Duel's case the condition was a post-syphilitic lesion. He did not believe the patient heard. He thought the combination of the speaking-tub method with the noise apparatus would have given a different result.

Dr. FIELDING O. LEWIS (Philadelphia), said the patient still insisted, with the use of the noise apparatus, that she could hear. Dr. Duel had made a handsome wager that she could not hear after the first operation, but by the careful tests described had demonstrated himself a loser, both to himself and all others present. After the ear became dry, following the second operation, the speaker had tested it again with the noise apparatus, and she still said she could hear sounds but could not determine words. He had her daughter, whom she could hear best, stand by her, without speaking, and the patient again insisted that she could hear sounds but not words. She had never had paracusis willisi. Wassermann test was negative, and she had been given iodides. Other tests were negative.

Dr. DUEL, in closing, said the functional tests had been as elaborate as they could be made. If, as might be assumed, a portion of the cochlea had been left at the first operation, the wax, impinging upon that, might have carried the sound waves in, if Dr. Shambaugh's theory was correct. If a remnant of the cochlea had been left at the first operation it had probably been removed at the second. The curettage of the vestibule in the first operation had not been done as thoroughly as that of the cochlea. In the second the whole labyrinth had been removed. The point he raised was whether destruction of the cochlea destroyed hearing.

(To be continued.)

Abstracts.

NOSE.

External Nasal Deformities, Correction by Sub-cutaneous Method.—
Lee Cohen (Baltimore). "Journ. Amer. Med. Assoc." December,
1916, p. 1663.

Cohen has adopted the methods introduced by Joseph for the correction of nasal deformities. He lays great stress upon the importance of proper technique. The vestibule of the nose should first be prepared by careful removal of all hairs with small scissors. The nose should then be thoroughly douched with sterile normal salt solution, after which soap and water, ether, and alcohol are used to complete the process in the vestibule. The entire face is also cleansed in the same manner, and is afterwards so draped with sterile towels that only the nose and mouth remain exposed. The mouth is covered with gauze. The entire nose, with the exception of the vestibule, is packed with sterile gauze and over this a pledget of cotton saturated with alcohol is placed. Local anæsthesia is usually employed. Cohen considers it of importance, in undermining the skin and in all subsequent steps of the operation, to introduce as seldom as possible the same instrument after its withdrawal from the wound. Rubber gloves should be used by the operator and his assistants.

Cohen records a case of a woman, aged thirty-seven, whose external nose showed a convex vertical deformity involving the bony and cartilaginous dorsum from the frontal notch to the tip. The tip drooped and the columna extended $\frac{1}{4}$ in. below the plane of the edges of the alæ. The deformity caused the patient much unhappiness. Under local anæsthesia the skin over the entire nose was undermined through the usual incisions, one on each side, made from the interior of the vestibule parallel with and just below the edges of the nasal bones and nasal (frontal) process of the superior maxillæ. The entire bony dorsum was now sawed through from the frontal notch down to the beginning of the cartilaginous portion. Before sawing, the periosteum was cut through along the same line with the sharp edge of a small periosteal elevator. The saw was introduced first on the left side. A fresh saw was then introduced into the right side. But slight lateral pressure was then needed completely to mobilise the bone. Pressure on the lower end of this segment removed every appearance of a hump nose. (In cases with a very marked hump, the portion sawn off may be removed through the incision in the nose.)

There still remained the elongated tip and the rather low plane of the columna to be corrected. This was accomplished by the removal of a triangular piece from the lower portion of the septum, the apex of the triangle being situated at the anterior nasal spine, the base upward and forward beneath the cartilaginous dorsum of the nose, just above the fleshy tip. This was done by first transfixing the membranous septum with a small knife and cutting upward and forward to the dorsum. A similar diverging incision was made above, through the lower part of the quadrilateral cartilage, forming the upper arm of the triangle. The piece removed consisted, therefore, partly of the membranous and partly of the cartilaginous septum. The edges of the wound were brought together by four superficial sutures of black silk on each side of the septum, after which two deep mattress sutures were introduced

through the cartilaginous septum above and the columna below so that, should the superficial ones pull out, a sagging of the tip would be prevented.

The vestibule was packed with iodoform gauze and a copper splint lined with lint applied externally. The first dressing was allowed to remain four days, and later the dressing was renewed every forty-eight hours. All sutures were removed on the eighth day.

Cohen also records a case of a male, aged twenty, whose nose was so deformed that he could not obtain a position. The nose bore some resemblance to the back of a camel. The deformity had resulted from an injury eleven years before and had been made worse by a second injury which was followed by abscess of the septum. The contraction following the abscess causes the depression. Altogether Cohen performed three operations on this case. He first made an attempt to furnish some substantial support for the tip of the nose. Under local anæsthesia, after separating the two layers of the septal mucous membrane, two-thirds of the right lower turbinal was removed with the Struycken scissors. The bone was completely stripped of muco-periosteum, straightened out and cut to the desired shape. The piece of bone was then planted between the layers of the septal mucous membrane, one end against the anterior nasal spine and the other beneath the nasal dorsum just above the fleshy tip. The septal incision was united and a Roe spring clamp introduced into the anterior nares to relieve pressure. The nose was packed with iodoform gauze. Healing took place by first intention.

Three weeks later, under local anæsthesia, the large bony hump was sawed off by the method described in Case I, and moved downward to fill in the depression over the cartilaginous portion. Healing was uneventful, but there still remained a slight indentation over the cartilaginous portion of the nose.

The patient was so satisfied with the result that it was only seven months later that his consent was obtained for the final step. Under ether anæsthesia, after again undermining the skin and preparing the dorsum nasi, a longitudinal section was removed from the fourth right sternocostal cartilage and placed on the nasal dorsum to fill in the depression. As before, the vestibule was packed and the copper splint applied. From the photographs the result appears to have been excellent. The psychologic effect on the patient was most interesting. Before operation he gave no heed whatever to his attire whereas afterwards he dressed with the greatest care!

J. S. Fraser.

Vincent's Angina.—**A. T. McClintock** (Wilkes-Barre, Pa.). "Amer. Journ. Med. Sci." February, 1917.

The writer refers to the question of the pathogenicity of the two organisms described by Plaut and Vincent. He concludes that "in many serious-looking anginas if the causative organisms are not those of Vincent, at least the predominance of the latter in the picture of a smear, appears to be a sure guide to a diagnosis of great importance, prognostically and economically." He believes that the difficulty of culture has prevented the more frequent recognition of the disease, since "smears are too rarely made." By the latter means the diagnosis is easy. Eleven cases are reported.

Thomas Guthrie.

EAR.

Tumour of the Auditory Nerve: Removal by the Translabrynthine Route.—Arthur af Forselles. "Nord. Tidskr. f. Oto. Rhino. Laryng.," B1. 1, no. 1, p. 29.

Male, aged forty-nine. History of three months' duration of right-sided headache and later of vertigo, diplopia, and failing vision, with deafness and vomiting. Examination of the cranial nerves revealed hypæsthesia of the sensory branches of the trigeminus of the right side and paresis of the abducens and facial. The right ear was deaf. There was spontaneous horizontal nystagmus to both sides, stronger to the left, although "the movements of the eyes were considerably greater on looking towards the right." The vestibular reactions were absent (from the right ear?). No spontaneous error was observable in the pointing test, but after rotation to the right deviation in pointing occurred. The sense of taste was deficient on the right side of the tongue, and the tongue was directed to the right when protruded. The gait was staggering and deviated towards the right. There was a tendency to fall towards the same side. The tendon reflexes were normal, but complicated movements were imperfectly carried out.

Owing to hæmorrhage, on one occasion apparently from the jugular bulb, the patient had to be operated on at three sittings. The tympanic cavity and antrum were opened up, the lateral sinus exposed, and most of the labyrinth removed as far as the internal auditory meatus. The dura of the cerebellum having been laid bare, it was divided from the lateral sinus to the internal meatus. Thereupon two cysts, as large as a pigeon's egg, protruded and were incised. In the internal meatus a tumour about the size of "the end of the little finger" was found and removed. Microscopically it was discovered to be a fibroma rich in cells. In spite of an attack of erysipelas during convalescence the patient made a good recovery, and two years after the operation he was free from any sign of recurrence and was able to work. The author finds the translabyrinthine route far less dangerous than Krause's operation, and he recommends it warmly when diagnosis is made early.

Dan McKenzie.

Labyrinthitis, with Operation on the Labyrinth.—Reid, M. A., and Lynch, M. A. "Medical Journal of Australia," December 2, 1916.

Seven cases were encountered among two hundred cases of chronic otitis media in twelve months. Detailed descriptions of symptoms, and methods of testing, and the treatment employed are given. Six cases were operated on, all made a good recovery. Facial paresis of short duration occurred in the majority of operated cases. The danger of injuring the facial nerve, if reasonable care and good fighting are employed is less than might be expected. The paresis in these cases could not be due to direct injury to the nerve. They were probably due to the serous exudation into the canal, or osteitis spreading from the bone wound.

A. J. Brady.

THROAT.

Systemic Results of Infections of the Mouth, Nose, and Accessory Sinuses.—Sydney Pern. "Medical Journal of Australia," October 21, 1916.

As regards the teeth, there are two distinct sources of infection—

pyorrhœa alveolaris and apical infection of devitalised teeth. Pern states that statistics show that over 60 per cent. of devitalised teeth have apical infection; and very few of these are causing local trouble. He says "there must be an enormous amount of chronic toxæmia in the community," and one is impelled to say that there must also be much bad dentistry! Diseased tonsils must be enucleated; this leaves us to infer that diseased accessory sinuses must be dealt with. A long list of ills following on toxic absorption is given. Pern goes on to state that there is another and very serious damage caused to the immunising mechanism by being constantly called upon and taxed beyond its resources. The thyroid gland is an important part of the immunising mechanism of the body, and if this organ is constantly being called upon to put forth increased effort thyrotoxic symptoms may appear. All grades of this symptom-complex, from nervousness, irritability, palpitation, inclination to be thin, etc., up to Graves' disease, can be caused by toxæmia from the sources indicated. Graves' disease, in most cases, quickly responds to treatment on the removal of a septic focus.

A. J. Brady.

MISCELLANEOUS.

The Influenza Epidemic of Spring, 1915: with Special Reference to Anomalous Throat Signs.—A. G. Shera. "Lancet," 1917, vol. i, p. 450.

This is a *résumé* of 500 cases occurring in South London. The group of symptoms falls under four headings: (1) Severe initial coryza; (2) erythema and persistent vesicles in the throat; (3) sequential neuralgias; (4) various complications. In no case was symptom (2) absent, and the author considers it to be pathognomonic in this particular epidemic of influenza. The variety of the complications was considerable, persistent neuralgia, vertigo, melancholia, sweating, labial herpes, conjunctivitis, and seventh nerve paralysis being the most prominent. The erythema and vesicles appear not to have been connected with the accumulated secretion of inflamed mucous glands, aphthous stomatitis or epizootic, or herpes zoster, but rather due to an influenzal intoxication of centripetal diffusion.

Macleod Yearsley.

REVIEW.

Cerebellar Abscess: its Etiology, Pathology, Diagnosis, and Treatment, including Anatomy and Physiology of the Cerebellum. By ISIDORE FRIESNER and ALFRED BRAUN. Pp. 186. With 10 full-page plates and 16 illustrations in text. London: William Heinemann. 1916.

A SOUND and readable contribution to the literature of an important subject. The monograph also gives us the latest views on cerebellar function, including those of Bárány on cerebellar localisation, determined by freezing of the cerebellar cortex in man.

With regard to cerebellar abscess, we have again to draw attention to a statement which we seem to have seen before, but which

can never be repeated too often, namely, that not all cases of cerebellar abscess reported as latent are really latent. All the same, we must also admit that, according to the statistics given us by the authors, in only some 34 per cent. of cases of cerebellar abscess is a failure to diagnose inexcusable. In the other cases, it would seem, symptoms are either altogether absent or they are obscured by the existence of the symptoms of other intracranial complications.

As the book shows, however, modern research is providing us with many more methods of testing the integrity of the cerebellum, and it is the duty of every ear-surgeon to make himself acquainted with them.

The whole of one's experience and reading, indeed, tends to the belief, which time only strengthens, that all cases of middle-ear suppuration are suspect all the time, and ought, therefore, to be systematically examined and tested with reference to intracranial complication at frequent intervals.

We are still being "surprised" by intracranial complications far too often, and it is possible that a more frequent survey of cases would enable us to forestall these events oftener than we do at this present. Many of these cerebellar tests are very delicate, and they are also simple and easy to apply.

Dan McKenzie.

CORRESPONDENCE.

MALPOSITION OF CERVICAL VERTEBRÆ, CAUSING A PHARYNGEAL SWELLING.

To the Editor of THE JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY.

DEAR SIR.—Two very interesting points have been raised by Dr. Dundas Grant in his kind reply to my letter, published in the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY, last month.

In the first place, he states that he has "for many years recognised and described to his pupils" the lateral swellings to which I referred. Yet Dr. Cyriax, in his paper, can give only one reference relating to the matter and says that he has failed to find anything on the subject in any text-book. I also have searched the literature, without result.

Secondly: Dr. Dundas Grant mentions that the swelling observed by him and described in Dr. Cyriax's paper was not lateral, but mesial in position. And yet this mesial swelling is said to be caused by the *transverse process* of the axis vertebra, malrotated to the extent of only 23 degs.

The question certainly deserves further investigation, and a definite distinction must be drawn between the pathological displacement described by Drs. Cyriax and Dundas Grant, and the physiological displacement described by me.

Yours faithfully,

EDINBURGH.

DOUGLAS GUTHRIE.

September 17, 1917.

NOTES AND QUERIES.

WHAT PHYSICAL CONDITIONS UNFIT A MAN TO BE A FLYING OFFICER?

"Amongst those young officers who have been passed into the Flying Corps, but who have been unable to pass the necessary tests in the prescribed time—

I have almost invariably found some trouble of the nose, throat, or ear. Rhinitis is a very common ailment amongst them, and it seems probable that when the Eustachian Tube is unhealthy, and when the patient is exposed to air currents of varying density, that the semi-circular cells must become affected. Thus I found a candidate who was 'turned down' by his instructor because he had a tendency to 'swing round' his machine, and because he could not accurately estimate his position in rotation to the ground, had really a blocked left nostril and ear. Another candidate was denounced as 'funker'—most horrible of charges—because, although always ready to go into the air when accompanied by his instructor, he got nervous, giddy, and lost control in a few moments when, after the usual number of lessons, he was sent up alone. This poor lad I found to have sinusitis and hay fever, which doubtless prevented that muscular co-ordination and that mental concentration which is essential to the aviator. Inasmuch as several of these teachers had themselves hay fever, and some of them even considered that the higher air improved it, they could not conceive that it might be a hindrance to a young, nervy, and untried man.

"One evening, an instructor complained to me bitterly of the stupidity of one of his pupils. At that moment the pupil—who had received the orthodox amount of training for the purpose—was flying alone. The instructor assured me that the pupil would probably break up the machine. He was perfectly right. Five minutes after the pupil descended, breaking up the machine in an awkward effort to land. As a kind of contemptuously superfluous afterthought, the pupil was sent to me next morning for a report. He had a badly ruptured tympanum; he had an enlarged tonsil; he had nasal stenosis; he had vertigo; he had enormous varicose veins in both legs. Doubtless he had various other ailments, but life is too short to pick them out."

"Bleeding from the nose and gums is not so common as one would anticipate. Headache and pressure on the ears are complained of on the downward journey, and not on ascent. Some airmen bleed, or ooze a noxious discharge from their gums every time they go up. One such complained to me lately, and a Medical Board decided he was unfit to fly. The hemorrhagic oozing from the gums appears to be associated with a condition that causes some intracranial oozing and induces giddiness."

"To ascertain the type of man—or, the type of abnormality or disease—which makes such a man so much the victim of his nerves that he is gripped with fright—like a hare on which an eagle swoops—that he cannot co-ordinate his faculties to wrest himself from destruction. Training clearly can do much, but certain physical imperfections of the nose, throat, ears, Eustachian Tube, and semi-circular canals seem to me to be most often associated with the man who gets gripped with air fear. Some of us are so particularly prone to become obsessed with views as to the importance of certain abnormalities, that it becomes difficult to take a detailed view, but I do not remember a man who was considered an unsuccessful flyer but in whom some such an abnormality could be demonstrated."—CAPT. J. C. McWALTER, *The Medical Press and Circular*, September 19, 1917.

BOOK RECEIVED.

Three Clinical Studies in Tuberculous Predisposition. By W. R. Rivers, M.R.C.S., L.R.C.P., D.P.H. London: George Allen & Unwin, Ltd., 1917.

THE
JOURNAL OF LARYNGOLOGY,
RHINOLOGY AND OTOTOLOGY.

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THE DEAF SOLDIER.

WE make no apology for returning to a subject already referred to on several former occasions in these columns.

Formerly our interest revolved around the treatment of the deaf soldier after he has left the Army, and we are glad to be able to record the fact that the organisation for handling these patients has been instituted, and is already in active operation. For this satisfactory outcome the country is indebted to the Ministry of Munitions, which tackled the problem with commendable energy and promptitude. We understand that Dr. Dundas Grant has been charged with the responsibility of carrying out in detail the schemes of the Pensions Minister.

There is, however, another aspect of the problem of the deaf soldier which will become at once apparent to anyone who reads the striking article by Dr. Sohier Bryant in our present issue (p. 338). From his statistical investigations we learn that one of the results of modern war developments has been a tremendous increase in injuries, generally serious, to the hearing apparatus.

Further, he tells us, what indeed has long been clear to the specialist, that prompt and early treatment of ear injuries is the best method of saving the individual to be a useful member of society, whether as a soldier in the field or as a citizen working at home.

Finally, the statement is made, and Dr. Bryant's authority is sufficient to ensure its accuracy, that of all the different varieties of medical organisation in the Armies of the English-speaking Allies, that of otology is the weakest.

In those now remote and far-past days, when the great war broke out, we ventured in this JOURNAL to draw the attention of the British Army medical authorities to the urgent need for erecting a specialist organisation for dealing with oto-laryngology. In response to the demand,

voiced, we may say, from many quarters besides ours, some efforts were made to meet the necessities of the times.

But Dr. Sohier Bryant's criticism shows only too plainly how much still remains to be done, and how important it is that the matter should be taken in hand and pushed through to a successful issue without delay.

D. M.

PREVALENCE OF EAR INJURIES AND DISEASES IN THE FRENCH ARMY.

By W. SOHIER BRYANT, A.M. & M.D.(HARV.), F.A.C.S., MAJOR
M.R.C., U.S.A.,

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THE importance of the subject of this paper was forced upon my attention this summer, while serving with the French as Médecin traitant d'Oto-Rhino-Laryngologie. The number of cases of ear injuries and defects seen was out of proportion to my expectation. The ear patients amounted to about the same number as the eye patients—that is to say, five or seven times as many as might have been expected. An investigation brought to light the numerical importance of the defective ears, their origin, and their economic gravity. I had the good fortune to assemble these statistics myself. Some of the figures came from personal observation; others were kindly furnished by the French War Office and by officers working in the speciality.

Comparing the eye and ear sick, I found more cases of total loss of function among the eye cases than among the ear cases. Further, there is a larger proportion of quickly recovering cases among the eye cases than among the ear cases. Among the ear cases we find a larger proportion of cases with a great impairment of function than with the eye.

In the zone des Armées at the Front, the total sick contains 16 per cent. of ear cases in the evacuation hospitals. These figures are equal, or greater, than figures for eyes. From the evacuation hospitals $4\frac{1}{2}$ per cent. of ear cases are evacuated to the rear.

In the rear of the zone des Armées, in the zone des Etapes, ear cases form $6\frac{1}{4}$ per cent. of total sick. These figures rise during time of inactivity at the Front and fall during military activity. Seven per cent. of these cases are evacuated from the zone des Etapes in the Interior.

In the Interior region ear cases form 9 per cent. of total sick.

I estimate that about 80 per cent. of the ear cases will show considerable impairment of function. This impairment will be sufficient to permanently interfere with the civil occupations of the patients. The above figures are for 1917, some of them approximate.

The large number of ear defects and their economic value make this branch of military surgery of considerable importance from a pension point of view. From my figures I estimate the allowance of pension claims for ear disabilities will amount to a minimum of 24 per 1000 of the fighting force per year.

The nature of the injuries of the ears and their complications fall into three categories :

- I.—Rupture of the tympanic membranes.
- II.—Complications of ruptured tympani :
 - A. Suppuration of middle ears, acute and chronic.
 - B. Mastoiditis, mastoid abscess and its complications.
- III.—Commotion of the eighth cranial nerve apparatus (the cochlear branches always suffer, the vestibular branches less frequently) :
 - A. Sudden onset.
 - B. Gradual onset.

The increase in large guns, shells, mines, bombs, grenades, etc., together with the longer exposure to rapid-fire arms, account for the increase of ear injuries among the soldiers of this war.

The loud detonations rupture the tympanic membranes, also cause hæmorrhage, ecchymoses, and molecular disintegration of the ear apparatus. Continued irritation of the ear apparatus by less violent explosions causes a molecular change and nutritional impairment resulting in a dry inflammation of the ear apparatus. Deafness and vertigo are common effects of "commotion" and "shell-shock" of whatever kind or nature.

The susceptibility of ears to damage at the Front is increased through obstruction of the nares, pharynxes, and Eustachian tubes. Susceptibility is increased also by absence of the middle-ear apparatus, as well as by its impairment through loss of continuity, loss of substance, and the presence of cicatrices. The presence of nutritional disturbances (dry inflammation), otosclerosis, "dry catarrh," calcification, fibrosis, etc., render the ear mechanically more delicate and susceptible to injury. At the same time all these conditions interfere with the repair of injuries. All the forms of dry otitis are very apt to increase rapidly under exposure to the excessive irritation of loud sounds. The clinical histories of many ear patients show the rapid (a few weeks) sequence of degenerative, dry inflammatory conditions of the middle ear following ear injury at the Front.

With appropriate care ruptured tympanic membranes healed without suppuration and with restoration of function in five to twenty-one days. After the occurrence of suppuration the duration of the trouble is longer. However, convalescence is considerably shorter than the course of middle-ear suppuration is in civil practice, and averages about twelve days. Uncomplicated middle-ear suppuration among the soldiers yields very quickly to dry treatment, probably because the condition is primarily traumatic, and is not due, as in civil practice, to an underlying pathological state.

In "commotion," or lesions of the eighth nerve, the acute cases give the best prognosis, but complete restoration of function cannot be expected. The treatment of these cases is prolonged auditory rest with general hygienic attention. In the cases of nerve lesions and commotion of gradual onset, no improvement can be expected with or without treatment.

The treatment of ruptured tympanic membranes and the prevention of complications is directed to the encouragement of spontaneous repair, which is best secured by the prevention of infection and suppuration. The care of the perforations should be aseptic, dry treatment, removal of moisture in the meatus by wiping, insufflation of sterile boric acid

powder, and plugging of the meatus with sterile absorbent cotton painted with collodion. The treatment should be repeated sufficiently often to secure the desired protection against suppuration. The treatment of suppurating middle ears and consequent complications is the same as is required in civil practice. The good results of treatment and operative intervention are surprisingly quickly obtained among the soldiers, and are very satisfactory.

The figures given above are smaller than the actual conditions warrant, because a considerable number of deaf ears are not brought to the attention of the surgeon. Many individuals bear the loss of a part of their hearing without complaint. Another considerable number of cases are not noted, because they are overlooked on account of graver injuries to other parts. The total number that slips through the statistics is probably equal to the number given on the statistical sheet. The greater part of the cases that do not appear on the statistics are those seen by the regimental surgeons, who make no available report on this subject. We can safely estimate the actual total or the figures of potential ear injuries to be twice the statistical figures given above.

The large number and the considerable functional impairment of the oto-laryngological cases occurring in the French Army is a warning to which all the Allies can pay attention. The English-speaking Allies especially should take notice, for with them the organisation of the special service of oto-rhino-laryngology is weakest.

The loss of industrial capacity and consequent increase of pension potentiality of these cases renders it incumbent on the proper authorities to use all the preventive measures available. The best possible organisation of experienced specialists supplied with sufficient material is needed for good results.

I wish to express my thanks to my *confrères* in the French Army oto-rhino-laryngological service, and to the chief surgeons and heads of the French Service of Military Health. Everyone has been most cordial and ready to help my investigation with suggestions and statistical data.

THE MORBID ANATOMY OF WAR INJURIES OF THE EAR.

BY J. S. FRASER, M.B., F.R.C.S.E., AND JOHN FRASER, M.D.,
F.R.C.S.E., CAPTAIN, R.A.M.C.

INTRODUCTION.

FROM the point of view of morbid anatomy, war injuries of the ear may be classified as follows:

(1) *Direct injuries* due to bullets or pieces of shrapnel or high explosive shell. (2) *Indirect injury* due to blows or falls on the head. These injuries may be subdivided into (a) those without fracture of the labyrinth capsule, and (b) those with fracture of the labyrinth capsule. (3) *Noise deafness* due to prolonged or intense gunfire, and (4) "*shell*" or "*explosion*" deafness (labyrinth concussion). Such conditions as hysterical deafness or deaf-mutism and malingered deafness do not come within the scope of this paper.

(1) *Direct Injuries*.—Fracture of the mastoid process or of the external meatus may occur with or without splintering of the bone.

The tympanum and labyrinth may also be involved in these cases. Further, the middle and inner ear may be injured by bullets entering through the facial bones and emerging through the mastoid or remaining embedded in the temporal bone. If the patient lives, the nature of the injury can best be ascertained by means of good radiograms—both lateral and antero-posterior. In severe and fatal cases of comminuted fracture of the petrous bone microscopic examination of the ear would be a matter of extreme difficulty, but where the injury is less severe this method may be of use. In many of these cases of direct injury suppurative otitis media occurs as a result of infection, either carried in by the foreign body at the time of the injury or due to secondary infection through the Eustachian tube or external meatus. By the kindness of Lieutenant-Colonel Caird, R.A.M.C., we are able to record a case in which infection took place (Case 1, *see later*).

(2) *Indirect injuries* of the ear, due to fracture of the base of the skull in civil life, were recently dealt with by one of us (J. S. Fraser) in the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY (July, 1917, p. 222). We have recently examined the middle and inner ear from a case of bullet wound of the fronto-parietal region, attended by laceration of the brain and hæmorrhage into the subarachnoid space (Case 2, *see later*).

(3) *Noise deafness* is due to physiological over-stimulation of the auditory apparatus. Recent researches have shown that (i) *air conduction of sound is of paramount importance* in the production of noise deafness. Conduction through the tissues of the body, including the cranial bones, is of little account. (ii) *The neuro-epithelium (hair-cells) of Corti's organ are first affected*, later the supporting cells are involved. The ganglion cells and nerve fibres are secondarily affected. The condition is one of so-called "degenerative neuritis." (iii) *The part of Corti's organ affected depends on the pitch of the sound*. If the noise be of high pitch the neuro-epithelium at the base of the cochlea is involved. If the noise be of medium pitch, Corti's organ in the middle coil is affected: while if the noise be of low pitch, degeneration is found in a portion of Corti's organ nearer the apex of the cochlea. These experiments confirm Helmholtz's theory of the peripheral analysis of sound.

It is very difficult or impossible to draw a line between cases of "noise" deafness and those of "shell" or "explosion" deafness, as both conditions are probably due to excessive movements of the atmosphere conveyed to the labyrinth. The explosion of a shell not only causes a great mass movement of air but produces a loud noise. It is stated, however, that the "blow" produced by the condensation of air following the explosion reaches the ear before the noise vibration, and that it may drive the stapes inward and fix it in the oval window so as to lessen the bad effect of the loud noise which follows. In somewhat the same way the stapes is fixed in Gellé's experiment.

(4) *"Shell" or "Explosion" Deafness (Labyrinth Concussion).*—According to Lermoyez "shell" deafness is the true war deafness. Various theories have been put forward as to the pathology of this condition. (a) In many cases we are actually able to observe a *rupture of the tympanic membrane*, accompanied by a certain amount of hæmorrhage. It has been stated that in cases of shell explosion in which the drumhead ruptures, there is less likelihood of damage to the delicate structures of the membranous labyrinth than in cases in which the tympanic membrane does not give way. In the same way the internal

mechanism of a watch, which has been dropped on the ground, is more likely to escape injury if the fall results in the fracture of the watch-glass. Mere rupture of the drumhead, however, unless accompanied by some lesion in the labyrinth, auditory nerve, or brain, would only produce a slight diminution of hearing. We know, however, that patients suffering from severe shell deafness exhibit marked or total loss of hearing. Some further lesion in the auditory apparatus must therefore be sought for.

(b) It has been stated that *hæmorrhages occur in the peri- or endolymphatic spaces* of the inner ear, and that the delicate neuro-epithelial sacs and tubes of the *membranous labyrinth are ruptured* by the violent concussion caused by the explosion. It is supposed that in this way a gross mechanical effect is produced in the inner ear. It would appear, however, that the structures of the membranous labyrinth are well protected from concussion because they are suspended in a lymph-bath inside the hollow spaces of the bony labyrinth.

Hæmorrhage may also occur in the *internal auditory meatus* with or without *rupture of the nerve fibres* which pass from the fundus of the meatus through rigid bony canals to the cochlea, utricle, saccule, and criste of the canals.

(c) It has been suggested that apart from these gross mechanical changes—(a) and (b)—the explosion and the loud noise may *destroy the delicate nerve endings in the cochlea*, and so result in paralysis. The loud sound due to the explosion may paralyse the hair-cells of Corti's organ, somewhat in the same way as the nerve structures of the macula in the retina are paralysed by the rays of the sun in "eclipse" blindness. According to this theory, "shell" deafness, like "noise" deafness, is due to paresis or paralysis following over-stimulation. Some observers hold that the change is a biochemical one, while others believe that it is of a molecular nature. Theodore has microscopically examined one case of labyrinth concussion followed by total deafness, and found a condition of degenerative neuritis similar to that described by Manasse and Wittmaack in old people.

(d) It has been stated that in cases of "shell" deafness the lesions are probably to be found in the brain—*e.g.* hæmorrhages in the pons, medulla, and cerebellum, involving the central connections of the auditory and vestibular nerves. According to this view, "shell" deafness has a similar pathology to cases of concussion of the brain in which there is no fracture of the skull—*i.e.* multiple small hæmorrhages.

(e) Milligan and Westmacott have suggested that shell deafness is due to a temporary interference with the neuron connections in the higher brain centres. They believe that the abrogation of function is *not* due to an organic lesion.

PRESENT INVESTIGATION.

The writers have examined the middle and inner ears from four cases of "shell" or "explosion" deafness. In each case the temporal bone on the injured side was removed by one of us (J. Fraser) within four or five hours of death. The labyrinth was not opened, but the specimen was at once wrapped in gauze soaked in 5 per cent. formol, then in waterproof tissue, and was finally surrounded by cotton-wool and packed in a cigarette tin. The lid of the tin was fixed on with adhesive plaster. All the specimens arrived in good condition and were

at once prepared for microscopic examination according to the method described by one of us (J. S. Fraser) in the *JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY* (December, 1913, p. 638).

It is doubtful if our methods are delicate and accurate enough to discover fine changes in the neuro-epithelium of the labyrinth due to shell or bomb explosion, especially in cases like the present ones (Nos. 3, 4, 5, and 6), where the hollow spaces of the labyrinth were not opened soon enough after death to allow the entrance of the fixing

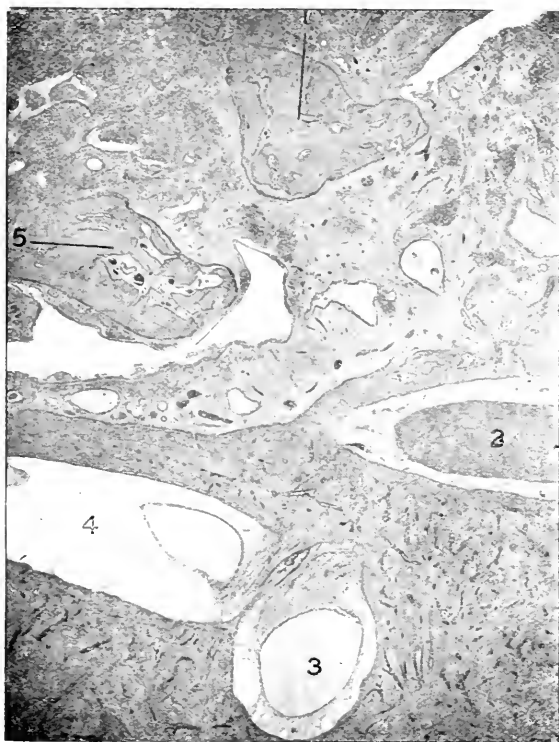


FIG. 1 (Case 1).—Direct injury of ear by shrapnel, followed by suppurative otitis media, cerebellar abscess, etc. Horizontal section 140, \times 11 diam. (hæmatoxylin and eosin). 1, head of malleus dislocated from 5, body of incus; 2, facial nerve; 3, ampullary end of superior canal with coagulated lymph; 4, lateral canal.

fluid. Further, the specimens had a prolonged journey from the Front to their destination in Edinburgh. Under these circumstances it would not be right to be dogmatic about fine changes in the neuro-epithelium or ganglion cells of the labyrinth. In one or two cases the writers have found displacement of the cupulæ of the canals and of the otolith membrane of the utricle and saccule. These may, or may not, be artefacts. In order to be accepted they would require confirmation by other observers.

There can, of course, be no doubt about such changes as rupture of the drumhead or extensive hæmorrhages into the middle-ear spaces or the internal meatus. It is interesting to note that in this latter

position the hæmorrhages occur at the point where the nerves, after passing to the fundus of the meatus, enter the fine bony canals. It is just at these parts that one would expect the small vessels to rupture and the nerve fibres to give way. It appears probable that the examination of the inner ear from cases of "shell" deafness, which die from other causes some months or even years after the shell explosion, would afford information of great value as to the true pathology of the

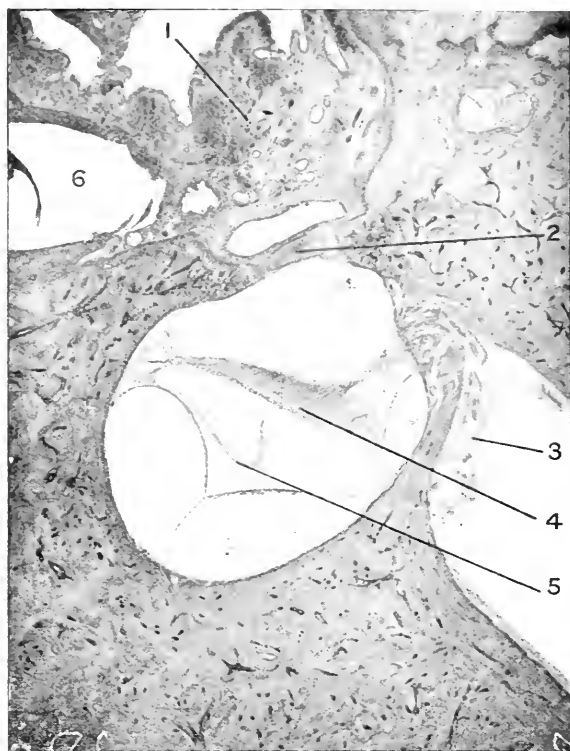


FIG. 2 (Case 1).—Direct injury of ear by shrapnel, followed by suppurative otitis media, cerebellar abscess, etc. Horizontal section 210, $\times 13$ diam. Shows upper part of oval window with vestibule. 1, swollen mucosa in niche of oval window; 2, foot-plate of stapes; 3, meningitis in internal meatus; 4, neuro-epithelium of utricle with 5, detached otolith membranes; 6, facial canal (the nerve is absent—artefact).

condition. The microscopic changes in the membranous labyrinth and eighth nerve would be much more evident at this period. It is therefore very important that every opportunity of examining the inner ear in such cases should be taken advantage of. We are of opinion that the sudden severe explosion and the loud sound accompanying it may probably paralyse the neuro-epithelium of the labyrinth in a manner analogous to—but more severe than—that in which noise deafness is brought about in boiler makers. If the observations of foreign otologists regarding "noise" deafness be applicable to cases of "shell" deaf-

ness, one would expect that "degenerative neuritis" would occur—at least in severe cases—and that certain definite changes would be found in the neuro-epithelium of the labyrinth and in the auditory and vestibular ganglia and nerves of soldiers who had suffered from severe shell explosion with its consequent deafness, tinnitus, giddiness, and loss of balancing.

Our findings lend little support to the view that in "explosion" or

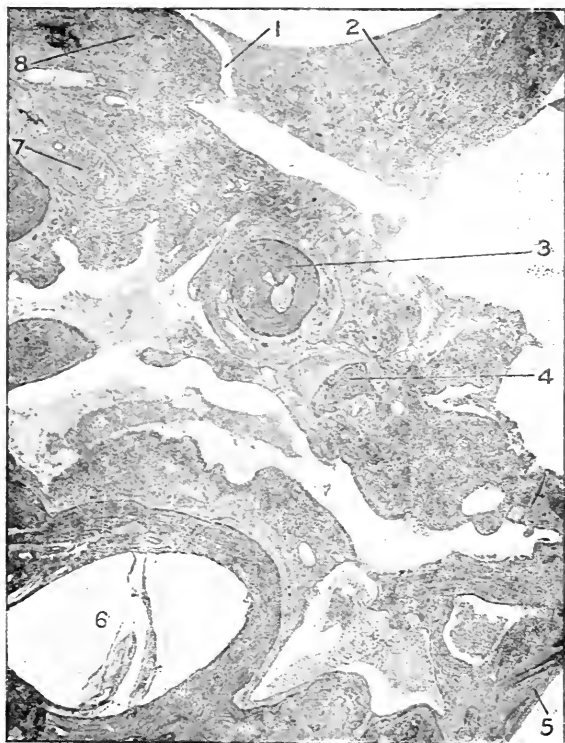


FIG. 3 (Case 1).—Direct injury of ear by shrapnel, followed by suppurative otitis media, cerebellar abscess, etc. Section 240, $\times 17$ diam. (hæmatoxylin and eosin). Shows, 1, rupture of drumhead; 2, middle portion of drumhead greatly swollen and infiltrated; 3, malleus in tympanic cavity; 4, erosion of incus; 5, fracture of stapes; 6, facial canal empty (artefact); 7, chorda tympani; 8, posterior part of drumhead.

"shell" deafness (1) large hæmorrhages occur in the peri- or endolymphatic spaces of the labyrinth, or (2) that rupture of the delicate neuro-epithelial sacs and tubes of the membranous labyrinth takes place. The changes we have observed will be found in detail in the reports of the microscopical examination of four cases of "shell" or "explosion" deafness (Cases 3, 4, 5, and 6). Briefly summarised, these changes are as follows: (a) Rupture of the drumhead in Cases 3, 4, and 6. (In Case 5 a large plug of wax was present in the external meatus and probably for this reason the tympanic membrane was not

injured.) (b) Hæmorrhage in the middle-ear spaces in all four cases. (c) Slight hæmorrhage in the scala tympani in the region of the round window and basal coil of the cochlea (Case 4). (d) Slight degenerative neuritis of the cochlear apparatus?—*e.g.* loss of hair-cells, slight flattening of the acoustic papilla and disappearance of some of the supporting cells, especially in Case 4; shrinkage of the ganglion cells of the spiral ganglion; uneven staining of the cochlear nerve. (All

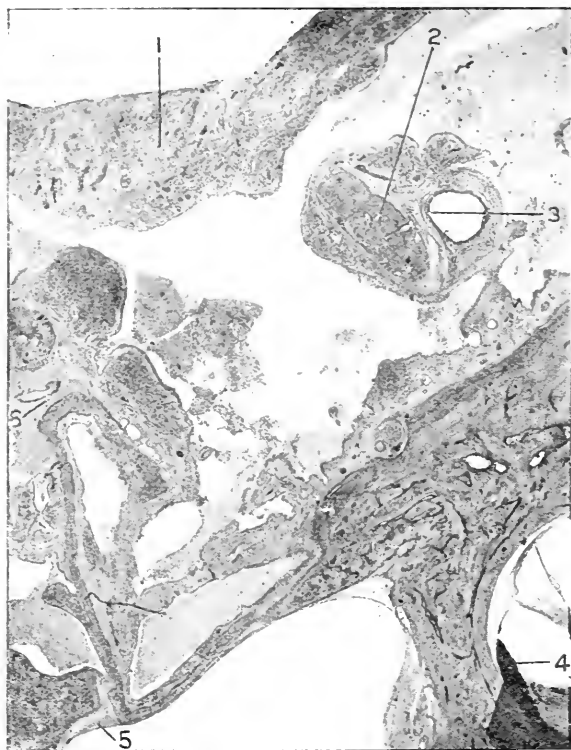


FIG. 4 (Case 1).—Direct injury of ear by shrapnel, followed by suppurative otitis media, cerebellar abscess, etc. Section 265, $\times 13$ diam. (hæmatoxylin and eosin). 1, greatly swollen drumhead; 2, handle of malleus separated from drumhead and lying in tympanic cavity; 3, squamous epithelium of drumhead attached to malleus; 4, blood in scala tympani of cochlea; 5, infiltrated posterior part of annular ligament (early stage of invasion of vestibule); 6, inco-stapedial joint, normal.

these may be *post-mortem* changes.) (e) Displacement of the otolith membrane of the saccule or utricle (Cases 4 and 5), artefacts? (f) Displacement of the cupula of one or more of the canals (Cases 4 and 5). (It is quite probable that (e) and (f) are artefacts.) (g) The vestibular apparatus, as was to be expected, showed less change than the cochlear. The neuro-epithelium of the saccule and utricle and the cells of the vestibular ganglion in the internal meatus appear to be better preserved than the corresponding parts of the cochlear

apparatus. (*h*) Hæmorrhage was observed in the fundus of the internal meatus at the points where the nerves enter the bony canals (Cases 3, 4, and 5).

CASE 1.—DIRECT INJURY BY SHRAPNEL.

The patient presented a shrapnel entrance wound in front of the left tragus. There was no exit wound. Acute suppurative otitis media

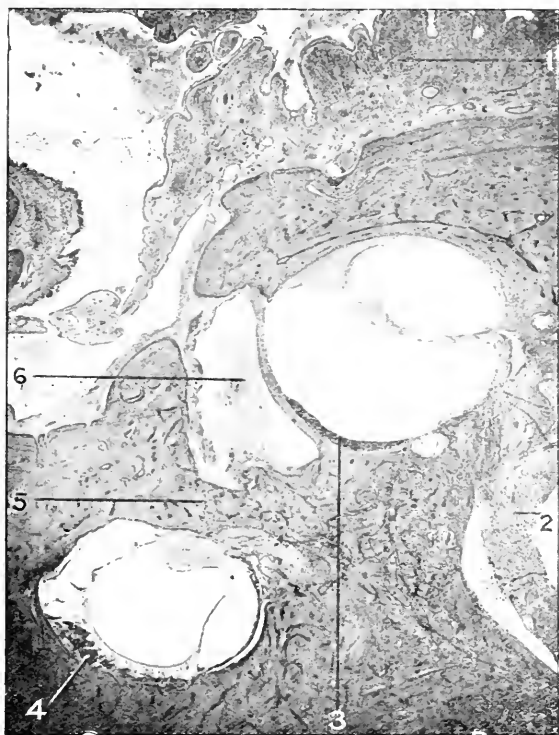


FIG. 5 (Case 1).—Direct injury of ear by shrapnel, followed by suppurative otitis media, etc. Section 360, $\times 11$ diam. (hematoxylin and eosin). Shows, 1, swollen, engorged, and infiltrated mucosa on promontory; 2, meningitis in internal meatus; 3, hæmorrhage in scala tympani of basal coil; 4, hæmorrhage in perilymph space of posterior canal; 5, fracture of bone between round window niche and crista of the posterior canal; 6, niche of round window.

supervened, and the patient suffered from discharge from the left ear and severe deafness. The case was only admitted to Colonel Caird's ward in the Royal Infirmary, Edinburgh, about a month after the injury. On admission (April 10, 1916), the pulse was 72 and the respirations 20 per minute. Temperature 97° F.

On April 16 there was a sudden rise of temperature to 103.6° F., and the pulse rose to 104. The patient complained of pain in the left ear, and there was an increase in the aural discharge. On examination granulations were seen on the anterior wall of the left external meatus.

April 18, 1916: Temperature 101° F. Frontal headache present, and pain in the right parietal region. Right ear normal

April 19, 1916: Temperature 97° F., pulse 66. Occipital pain present, with nausea and vomiting. The patient was examined by Dr. Logan Turner, who found slight facial paresis on the left side; spontaneous nystagmus to the left, with a pointing error at the left wrist and shoulder joints; pain present on pressure over the neck muscles; mastoid tenderness on the left side, and complete deafness in

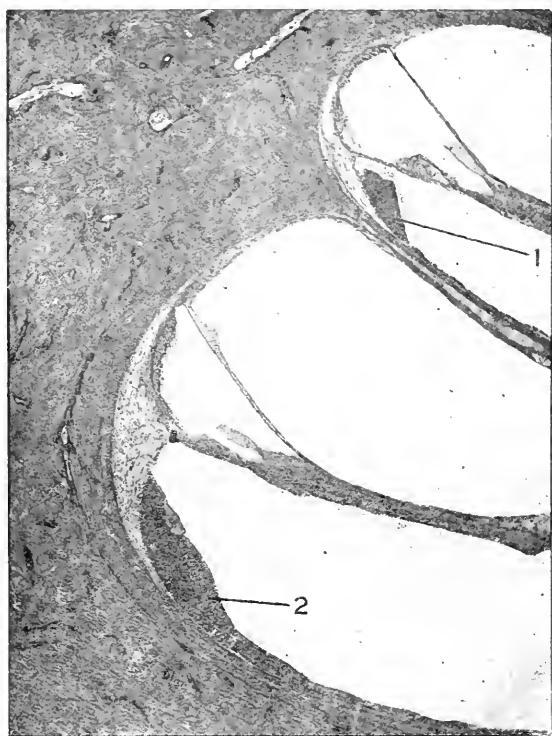


FIG. 6 (Case 1).—Direct injury of ear by shrapnel, followed by suppurative otitis media, cerebellar abscess, etc. Horizontal section 240, \times 28 diam. (hematoxylin and eosin). Shows, 1 and 2, hemorrhage in scala tympani in middle and basal coils.

the left ear. The tuning-fork on the vertex was lateralised to the right (good) ear! The patient was too ill for the caloric test. On lumbar puncture the cerebro-spinal fluid was found to be clear and not under increased tension.

Operation (April 19, 1916), by Colonel Caird. Granulation tissue found in the antrum along with some particles of nickel. The cerebellum was exposed behind the sinus and was found not to pulsate. On exploration a teaspoonful of pus was evacuated (*Staphylococcus albus* on culture). The cerebellar abscess was drained.

April 20, 1916: Temperature and pulse normal, headache less severe.

April 21, 1916: Temperature rose to 102° F. at 5 p.m. The patient showed signs of distress and died immediately.

Post Mortem.—Cerebellar abscess with early meningitis.

Macroscopic examination of right ear.—Pus in the external meatus; small perforation of tympanic membrane: the Eustachian tube contains blood-stained mucus; granulations in the mastoid antrum; saccus endolymphaticus healthy; sigmoid sinus and jugular bulb thrombosed along with the inferior petrosal sinus. (It will thus be seen that three intracranial complications were present.)



FIG. 7 (Case 1).—Direct injury of ear by shrapnel, followed by suppurative otitis media, cerebellar abscess, etc. Horizontal section 270, $\times 35$ diam. (iron-haematoxylin). Shows the normal (?) condition of Corti's organ in apical and middle coils. The nerves in the bony spiral lamina stain well.

Microscopic Examination of Right Ear.

External Meatus.—Lining membrane swollen and congested.

Tympanic Membrane.—Upper part of drumhead very thick and infiltrated; lower part perforated. There is a small, irregular piece of bone with granulations around it in the middle of the drumhead. The tympanic membrane in its lower part is adherent to the inner wall of the tympanic cavity.

Tympanum and Middle-ear Spaces.—The mucous membrane of the air-cells in the roof of the antrum is swollen, congested, and infiltrated

with small cells. Muco-pus is present in the cells, and the bony walls are eroded in parts. At other parts there is some new bone formation in the walls of the cells. Some of the air-cells contain a little blood. There is marked erosion of the bone on the inner wall of the attic. The mucosa of the tympanic cavity is swollen and polypoid. The canal for the tensor tympani is eroded. There is a fracture of the neck of the malleus, the lower part of the neck along with the handle being drawn

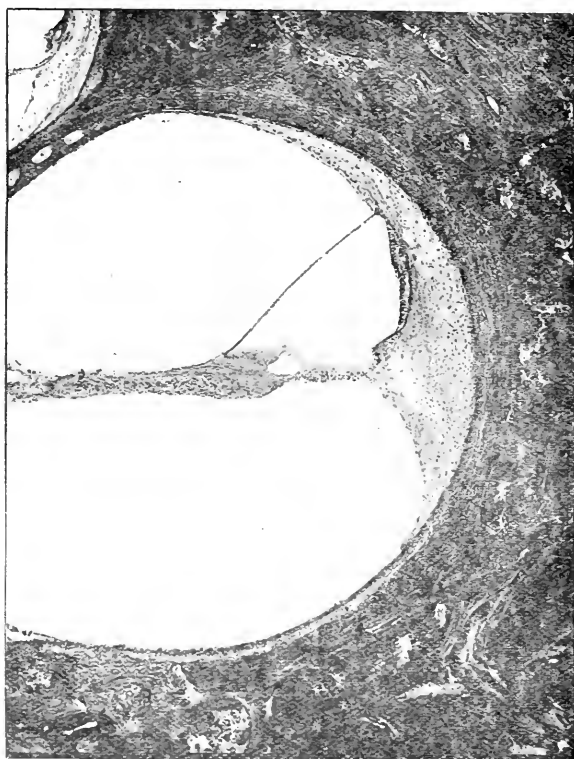


FIG. 8 (Case 1).—Direct injury of ear by shrapnel, followed by suppurative otitis media, cerebellar abscess, etc. Horizontal section 270, $\times 38$ diam. (iron-haematoxylin). Shows condition of Corti's organ in upper part of basal coil. The acoustic papilla is reduced to a layer of flattened cells. The stria vascularis is normal.

inwards by the tensor tympani. The squamous epithelium of the drum-head is still attached to this lower fragment. The head of the malleus is healthy as is also the body of the incus, but the two bones are widely separated and the joint space is filled with granulation tissue. The foot-plate of the stapes is fractured (*see* Fig. 3, No. 5); the annular ligament shows evidence of early invasion by the inflammatory process in the middle ear. The stapedius muscle is normal, as is also the joint between the incus and stapes. The membrane of the round window is

thickened, and the niche is full of pus. The Eustachian tube is full of muco-pus and its lining membrane is swollen.

Labyrinth Capsule.—The vessels of the fossa subarcuata are congested. There is a small hæmorrhage in the facial canal, but the nerve is normal.

Labyrinth Contents—(1) *Cochlea.*—There is hæmorrhage in the scala tympani of the basal and middle coils. Corti's organ presents its normal

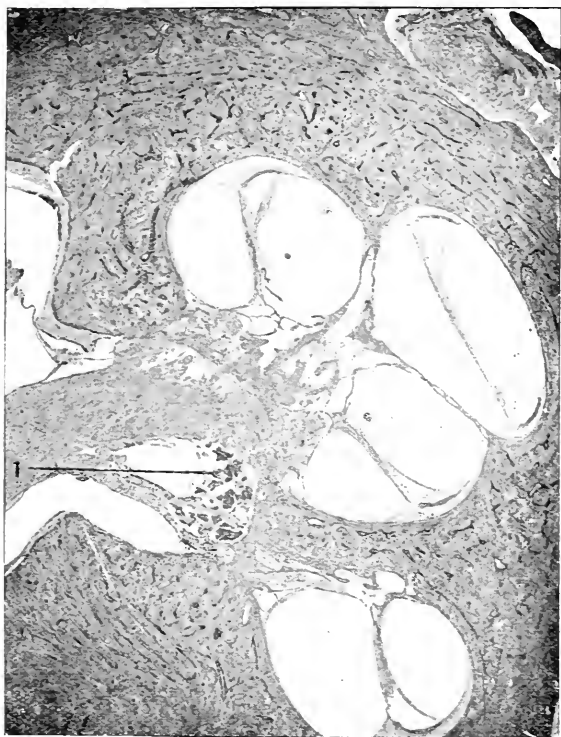


FIG. 9 (Case 2).—Bullet wound of fronto-parietal region, followed by intracranial hæmorrhage; no direct injury of ear. Vertical section 60. \times 11 diam. (hæmatoxylin and eosin). Shows, 1, hæmorrhage in fundus of internal meatus between fibres of cochlear nerve. Corti's organ appears normal in middle and apical coils.

mound-like appearance in the middle coil, and the pillar cells are clearly seen. The cochlear ganglion appears to be healthy. There is hæmorrhage in the cochlear opening of the perilymphatic aqueduct.

(2) *Vestibule.*—The neuro-epithelium of the saccule and utricle appear to be desquamated and the otolith membrane is separated. There is a small hæmorrhage in the perilymphatic space in the neighbourhood of the vestibular opening of the endolymphatic aqueduct; elsewhere the aqueduct is normal. (It must be remembered that invasion of the vestibule through the oval window was just beginning.)

(3) *Canals*.—The superior canal shows desquamation of the neuro-epithelium of the crista. Coagulated lymph is present but the cupula is absent. The external canal is normal. The posterior canal shows some pus cells in the perilymph space, and hæmorrhage is also present at the ampullary end. The neuro-epithelium of the crista of the posterior canal is desquamated.



FIG. 10 (Case 2).—Bullet wound of fronto-parietal region, followed by intracranial hæmorrhage. No direct injury of ear. Vertical section 185 (hæmatoxylin and eosin). Shows, 1, hæmorrhage along facial nerve above vestibule; 2, facial nerve on inner wall of tympanum; 3, hæmorrhage; 4, niche of oval window; 5, intravestibular part of cochlea; 6, opening of perilymph aqueduct; 7, hæmorrhage along nerve to ampulla of posterior vertical canal; 8, saccule.

Internal Meatus and Nerves.—Meningitis is present within the arachnoid sheath, but the eighth nerve has been torn out at the *post-mortem*.

Summary.

The case was one of shrapnel injury of the left ear followed by suppurative otitis media. When the patient was admitted to the Royal Infirmary, Edinburgh, about a month after the injury, symptoms of cerebellar abscess were present. Operation revealed mastoiditis and

small metallic particles in the mastoid antrum. In spite of the evacuation of the cerebellar abscess the patient died. The autopsy showed early meningitis and sinus thrombosis in addition to the cerebellar abscess. Microscopic examination of the ear demonstrated a thickened, infiltrated and perforated drumhead with fracture of the malleus. The lower part of the handle was separated from the drumhead and drawn inward by the tensor tympani. (We are unaware of any previous record of a similar condition.) The mucosa of the middle ear was distinctly swollen, and the tympanic cavity, antrum and cells were full of pus. The joint between the head of the malleus and the body of the incus was dislocated. The inco-stapedial joint was healthy, but there was fracture of the footplate of the stapes and early invasion of the vestibule through the annular ligament. The cochlea showed hæmorrhage in the scala tympani of the basal and middle coil and in the opening of the perilymphatic aqueduct, but the nerve apparatus of the cochlea appeared almost healthy. The neuro-epithelium of the saccule and utricle and of the cristæ of the canals was desquamating. The internal meatus showed meningitis.

Note.—Several of the changes noted in this case may have been due to small pieces of shrapnel casing—*e. g.* fracture of the malleus and stapes, hæmorrhage in the scala tympani and fracture of bony capsule of ampulla of posterior canal.

CASE 2.—INDIRECT INJURY OF THE EAR, DUE TO BULLET WOUND.

The patient was hit in the fronto-parietal region, and the bullet came out just above the ear on the same side. There was no apparent injury of the ear itself, but the parietal bone was shattered and the brain lacerated.

Microscopic Examination.

The external meatus and the tympanic membrane are normal.

Middle-ear Spaces.—Free blood is present in the lower part of the tympanic cavity, in the niches of the round and oval windows and in the mastoid antrum.

Labyrinth Contents.—The nervous structures of the inner ear appear to be normal, but a little blood is present in the aqueduct of the cochlea, near its cranial end, and also around the vestibular nerve to the utricle.

Internal Meatus.—There is a considerable amount of hæmorrhage within the arachnoid sheath which surrounds the seventh and eighth nerve. The bleeding is specially marked in the fundus of the meatus and extends along the facial nerve to the geniculate ganglion. This hæmorrhage appears to have been due to the injury to the brain and meninges.

(A similar case was recorded by Mr. Sydney Scott in the *Proceedings of the Royal Society of Medicine*, 1915, Otological Section.)

(To be continued.)

SOCIETIES' PROCEEDINGS.

ROYAL SOCIETY OF MEDICINE—LARYNGOLOGICAL SECTION.

February 2, 1917.

President: Mr. T. MARK HOVELL.

(Continued from p. 328.)

Epithelioma of Left Maxillary Antrum and Left Ethmoid, Four Years after a Moure's Operation (Lateral Rhinotomy).—Sir StClair Thomson.—This case is published in full in the *Lancet* for May 13, 1916, and was shown before the Clinical Section of the Royal Society of Medicine, February 14, 1913, and the Clinical Congress of American Surgeons, July, 1914. The interesting points will, therefore, be referred to briefly.

The subjective symptoms were slight and recent: grumbling pain in the cheek for two months. In the Moure operation two facial incisions were made, instead of the single one now recommended. Alarming symptoms, suspicion of serous meningitis, followed the operation, but subsided in a few days. The growth was a squamous-cell carcinoma, and although it had broken through the canine fossa and the antro-nasal wall, there is no recurrence after four years. The absence of disfigurement and the comfort of the patient, especially when compared with the operations formerly employed in general surgery, are remarkable. There is no trouble in the way of atrophic rhinitis, in spite of turbinal removal, and there is no epiphora.

Round-celled Sarcoma of Right Maxillary Antrum, Ethmoid and Nasal Cavity, Two Months after a Moure's Operation (Lateral Rhinotomy).—Sir StClair Thomson.—E. C—, aged sixty-two. This case is also interesting on account of the slight, recent and even remote symptoms the patient complained of. He consulted Mr. Hugh Smith, of Farningham, simply because of right occipital headache and insomnia, and it was only incidentally that he referred to nasal obstruction on the same side. This was found to be caused by a fleshy, vascular growth on the roof and outer side of the right choana and was evidently an off-shoot of malignant disease of the right maxillary and ethmoidal sinuses. There were decidedly hard glands in the right neck.

On December 13, 1916, a Moure's operation was performed through a single facial incision. This gave easy and complete access to the antrum, ethmoid, and roof of the nose, which were all crowded with typical malignant growth. The os planum had been destroyed by it, and the cribriform plate had gone, so that the dura mater was exposed and its pulsations were easily watched. Removal may be incomplete, but the case is shown to illustrate the great advantage of a single incision, the relief of symptoms, and the absence of disfigurement.

Hæmorrhage was easily controlled during operation. The exposure and handling of the dura mater caused no after symptoms. A fortnight

after operation the patient complained of blindness in the right eye and he was found to have a retrobulbar neuritis with papillary oedema. The glands in the neck have had three applications of X rays, and can hardly be felt.

N.B.—The patient has not been seen since January 4, and conditions may have altered.

Carcinoma of the Right Maxillary and Ethmoidal Sinuses, Seven Months after Operation by an Oblique Facial Route.—Cecil Graham.—C. S.—, aged fifty, was seen by Dr. Hill in May, 1916, on account of swelling of the right cheek, proptosis, and nasal obstruction, with blood-stained discharge. The right nasal fossa was filled by growth, which obscured the view beyond the vestibule. Dr. Spilsbury reported upon a piece of the growth sent for microscopical examination that it was "squamous carcinoma of a very malignant type."

After the removal of several carious teeth, operation was performed on May 24, 1916. Dr. Chaldecott giving ether by the intratracheal method. An osteoplastic flap, resembling that which Dr. Watson-Williams describes, was turned over the cheek on the left side, the septum was removed completely behind the vestibular portion, and a complete view with easy access, was obtained, by which it was possible to remove the lateral mass of the ethmoid, the inner wall of the maxillary sinus, the floor of the orbit, to clear out the cavity of the maxillary sinus, to remove some growths adherent to the orbital periosteum interiorly, and to explore the sphenoidal sinus. The latter was not involved. The patient sat up in twenty hours, was out of bed in forty hours, and left hospital in twelve days after the operation, after an uneventful recovery. The method of anæsthesia was a great comfort during the operation, particularly with regard to hæmorrhage, although this was not great.

Carcinoma of the Right Maxillary Antrum; lateral Rhinotomy (Moore's Operation) performed.—Irwin Moore.—Patient, a woman, aged sixty-two, attended hospital in September, 1916, complaining of gradual swelling of the upper part of the right cheek during the previous seven weeks. No nasal discharge was present or any other symptom. On the upper lip was seen a scar resulting from an old sore occurring forty years ago. Patient was not seen again for a month. At this time she complained of pain in the right temporal region, ear, upper jaw, and under the eye. Transillumination showed both antra opaque. On puncturing and washing out the right antrum, the fluid passed freely and the washings contained a considerable quantity of pus. Slight bleeding followed the puncture.

On November 8 the antrum was explored through the canine fossa, and found to be partly occupied by a polypoid growth, infiltrating the anterior bony wall, and extending upwards and outwards under the malar bone.

Portions of growth were removed for examination.

On November 23 a lateral rhinotomy (Moore's operation) was performed by means of the double incision. The anterior bony wall of the antrum was found to be involved and extensively necrosed; the soft parts of the cheek were not infiltrated. The antro-nasal wall, floor of antrum and orbit were apparently intact. The growth, together with the necrosed anterior wall, was removed by forceps and curettes; five days later the face wound had healed and the sutures were removed,

only slight œdema of the lower eyelid being present. No rise of temperature occurred above 100.4° F. She returned home twelve days later.

Patient is now shown, three months after operation. There is practically no nasal discharge, and she only complains of slight pain in the right upper jaw.

Microscopical Report.—This growth has the histological structure of a carcinoma. The cancer cells are arranged in the form of solid masses and columns, freely infiltrating the fibrous stroma. There is no evidence of invasion of the bone by the growth. Whether the carcinomatous cells take origin from the glandular element of the dermic element of the mucous membrane is not quite demonstrable, but many of the alveoli are somewhat cylindrical in form, suggesting the glandular element.

A similar case to this, in which the growth proved to be a small round-celled sarcoma, was shown by the exhibitor at the meeting of the Laryngological Section¹ on November 3, 1916.

The case is of interest in that:

(1) Primary carcinoma of the maxillary antrum compared with sarcoma is rare.

(2) It further confirms (as in cases previously shown at the meetings of this Section) the great advantage of Moure's operation, with its free access and thorough removal of the disease, over complete resection of the upper jaw with its accompanying deformity and discomfort.

Microscopical sections of the growth are shown.

Dr. WATSON-WILLIAMS: I pass round a specimen to show the degree of approach one can get to the inferior part of the nose by making an osteoplastic flap on the same side as the growth. This was a case of round-celled sarcoma, which was very hæmorrhagic. In 1907 I performed the first operation on this patient.² A growth the size of a bantam's egg appeared to have originated in the upper and posterior aspects of the ethmoid labyrinth; it involved the antrum, and extended to the septum. It seemed to have recurred in 1910, but a piece removed *per nasum* was pronounced by the pathologist not to be malignant. But it did recur in 1916—nine years after the operation. The lesson from that is, that a vascular sarcoma is not necessarily of a high degree of malignancy. The entrance gained by this osteoplastic flap, sufficient to enable one to get the growth entirely away, to clear the ethmoid labyrinth, and remove the central and sphenoidal sinus wall, affords all the approach that could be wished. The osteoplastic flap was replaced carefully, and it healed, leaving no scar or depression whatever. One advantage of the removal of the septum nasi is that it enables us to get an oblique approach to the left side through the right nasal passage, should that be desired.

Mr. E. D. D. DAVIS: I saw Sir StClair Thomson operate on the old man shown to-day, who was blind in one eye. He performed Moure's operation for sarcoma of the antrum, and I was surprised at the easy access he obtained. There was only one incision, down the side of the nose, and it could be continued into the lip or upwards. It was not necessary to make a second incision under the eye. I have myself had only a small number of cases, and I have employed Moure's operation, and by continuing the incision in a straight line, I have obtained good access. I have found intratracheal ether a great comfort, and it adds

¹ *Proceedings*, p. 29.

² For description and illustration of my operation see *Rhinology*, p. 113.

to the ease of the operation. In this patient the dura mater was exposed, but he seems to have recovered in a very satisfactory way, and the operation was excellent.

Mr. FRANK ROSE: There is a remark in Dr. Irwin Moore's record of his case: "This case is of interest in that primary carcinoma of the maxillary antrum compared with sarcoma is very rare." My experience has been precisely the contrary. In cases of malignant disease of the maxillary antrum, the growth has proved, under the microscope, to be carcinoma. I can only recall two cases in which it was sarcoma, and even in those it was not certain that it did not begin in the ethmoid. On what grounds does Dr. Irwin Moore make the statement?

Dr. DAN MCKENZIE: I agree with Mr. Rose that malignant disease of the antrum is generally epithelioma, while the ethmoid is the seat of sarcoma. Allusion has been made to the fact that those sarcomata are "'query' sarcomata," as their malignancy is so slight and they seldom recur after removal. The occurrence of serous meningitis in Sir StClair Thomson's case is interesting. A mild form of serous meningitis is, I believe, not uncommon after nasal operations. In cases of that kind of difficulty a hint might be borrowed from the otologists and lumbar puncture done, because of the very prompt relief it affords. It may be necessary to repeat it after two or three days' interval.

Dr. KELSON: When I first saw Dr. Irwin Moore's case, which is a very interesting one, there was a dulness on both sides on transillumination, and pus was present in both antra. As there was a history of syphilis in the case, I suspected a tertiary syphilitic lesion, but Dr. Moore was anxious to do a Moure's operation, and then it was found to be malignant.

Dr. PEGLER: If Dr. McKenzie wishes us to take him seriously in regard to what he has just said as to nasal sarcomata, I fear I am in total disagreement with him. Though far less malignant than carcinomata, these growths range themselves quite easily under the groups of small and large round-cell sarcomata, met with elsewhere.

Dr. DONELAN: As regards the ætiology, some of these cases may be due to disease of the ethmoid. Several years ago I removed in one case a large number of mucous polypi and curetted the right ethmoidal region. The patient remained well for about ten years. Four years ago he wrote that his trouble had recurred, but he did not come up until early last year. He had then a large mass of apparently mucous polypi, with some hard red polypi amongst them, growing from the ethmoid and filling the antrum. I removed the whole mass by Moure's operation. The report stated carcinoma. Recurrence, however, took place in the orbit, and the patient died nine months later. This case would appear to confirm Mr. Rose's view that malignant growths of this region are generally carcinomatous.

Dr. W. HILL: Mr. Graham is to be congratulated on his technique, though I do not say it will supersede Moure's operation in every instance. One gets by it a very extensive and open lateral view, including the ethmoidal region, the cribriform plate, the sphenoidal sinus wall, and the whole antral cavity. All must be impressed by the æsthetic result, as the incision scars can scarcely be seen, and thus compare favourably with the evident scars in Moure's operation.

Dr. IRWIN MOORE (in reply): I think I must be wrong in stating that primary carcinoma in this situation is rare. I have just had a conversation with Mr. Trotter, and he considers that carcinoma is more common than sarcoma. I thank Dr. Kelson for transferring the case

to me. It is now three months since the operation, and I find that during the last month there has been a recurrence. With regard to the question of the single incision it was impossible in this case to reach the growth and clear it away without a double incision, because the antral wall was so much infiltrated by the disease. As in the case of a sarcoma of the antrum, upon which I recently operated, and which I showed at the last meeting, the growth could not have been satisfactorily reached and removed by one incision, owing to the muscles of the cheek being extensively infiltrated.

SIR STCLAIR THOMSON (in reply): In my first case, although I did not think I was near the cribriform plate, the patient got symptoms which were very alarming: she was apathetic the next day, and had a temperature of 104° F., but she recovered. In the second case Mr. Davis will confirm my statement that the cribriform plate was gone, the dura mater was freely exposed, and yet the patient was not the worse. Neither of the cases had suppuration: there was no sinusitis going on. The first case would have been in a different condition had I accidentally wounded the cribriform plate or the olfactory region in the presence of streptococci, for instance. In the second case the near to the accessory ostium. If you open the antrum through the canine fossa and take hold of the polypus from its choanal aspect, you will see that the pull is also being exerted on the mucous membrane of the antrum. Frequently they are unassociated with any purulent secretion. They seem to me to be a localised chronic inflammatory condition of the antral mucous membrane. In many cases a permanent cure may be brought about after one removal by forceps or snare, but recurrences can only be prevented by opening the antrum and removing the implanted pedicle of the tumour.

DR. DONELAN: Seven years ago I operated upon a young man for a long pedunculated growth springing from the right accessory ostium, and I showed the specimen here. There was no suppuration in that case, and several growths of the kind have been recently shown before the Section in which it was stated they were not associated with suppuration. A fortnight ago I operated on the opposite antrum of the same patient, but the right antrum, from which the growth was originally removed, had remained quite healthy. That supports Mr. Tilley's statement that we should not always be so anxious to enter through the canine fossa. For my part I think it quite unnecessary, and I have seen one or two cases in which after that procedure the levator anguli oris has been involved in the cicatrix of the canine opening, establishing a chronic smile on that side.

DR. JOBSON HORNE (in reply): With regard to opening the antrum, we must remember that these cases of so-called choanal polypus are not in the same category as the more common cases of nasal polypus, and the pathogenesis is entirely distinct. Some of them appear to be congenital, although of slow growth, therefore they cannot be discussed on the same footing as suppurative disease of the antrum. I did not open the antrum in this case, because I felt I should like to do to my patient as I would like to be done by: after the polypus had been removed, I would like my antrum left untouched. If there should be a recurrence, then we would consider the advisability of investigating the antrum, and even if that were done I do not think a further recurrence would be prevented.

DR. IRWIN MOORE (in reply): I am expressing the views held not only by Mr. Brown Kelly, who has records of forty cases of choanal

polypi arising in the maxillary antrum, but also by Dr. Syme, whose articles on "Choanal Polypi," in a recent issue of the *JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY*,¹ deals with this matter; and also by Kubo, whose contribution on "Solitary Choanal Polypi" was published in 1913. All agree that these growths should be dealt with by radical operation. Transillumination for diagnostic purposes is of no value in these cases, for the antrum on the affected side is as translucent or even more so than on the normal side, whereas to X rays the affected antrum appears opaque. This contrast of transillumination and X rays has been investigated by Mr. Hett and Dr. Finzi. The combination of these two tests is of great diagnostic value in the localisation of antral polypi.

Hæmatoma (?) of the Posterior End of the Inferior Turbinate.

—**F. A. Rose.**—In August, 1916, the patient (a medical man) complained of a blood-stained discharge from the back of his nose for three days, following stuffiness of one nostril of considerable duration. A smooth, round swelling filled three-quarters of the right choana. It looked like a blood-clot, but all attempts to wash it away were futile, and finally it was snared. It will be seen that the swelling consists of delicate connective tissue infiltrated with blood. There have been no symptoms since removal. Has anyone present met with a similar case?

Dr. PEGLER: I know of no previous record of a hæmatoma of the posterior end of an inferior turbinal. Mr. Somerville Hastings once exhibited sections of a discrete nasal angioma of the usual type, but the present is a pure hæmatoma.

Mr. FRANK ROSE (in reply): The patient was between thirty-five and forty years of age. I have not seen or read of a similar case.

Specimen from a Case of Fatal Hæmorrhage from Gunshot Wound involving the Superior Thyroid Artery.—**H. Lawson**

Whale (shown by Dr. Dundas Grant).—Private G. H.—, admitted November 1, 1916. His temperature was 103·6° F., pulse 128, respiration 36, and the bases of both lungs were dull. A rifle bullet had traversed his larynx in the coronal plane, entering on the left side opposite the greater cornu of the hyoid, which was fractured at its junction with the body of this bone, and emerging at the level of the right aryepiglottic fold.

On November 3 a fit of coughing caused profuse intralaryngeal hæmorrhage, which was unaffected by digital pressure applied to the carotid artery; and in a few minutes, before further measures could be adopted, he died from asphyxiation.

Autopsy.—The lower lobes of both lungs were solid with pneumonia. The trachea and bronchi were full of frothy serum and short, broken casts of blood-clot. The course of the bullet corresponded to the clinical appearances. In its transit it had fractured the left greater cornu of the hyoid at its junction with the body, and, traversing the anterior part of the supraglottic space, had deeply grooved the base of the epiglottis. The right superior thyroid artery, at the highest point reached by the upward loop at its origin, had been cleanly severed by the bullet.

Carcinoma of the Floor of the Mouth treated by Diathermy.

—**F. A. Rose.**—G. M.—, aged fifty-six, was seen by Mr. Tilley, who diagnosed carcinoma of the floor of the mouth in July, 1915. August,

¹ *JOURN. OF LARYNGOL., RHINOL., AND OTOL.*, 1916, xxxi, p. 515.

1915: Diathermy was applied by Mr. Harmer. November, 1915: A second application was made by the exhibitor. At the present time there is no ulceration, and the patient is perfectly comfortable except for a feeling of tightness caused by the scar tissue.

Mr. HERBERT TILLEY: The result in this case is excellent. There was a hard ulcer, now there is a soft scar. Such a case gives us hope that in these early stages of malignant disease one may get a good result by a simpler form of treatment than the usual operations which are necessary for dealing with cancer of the floor of the mouth.

Mr. FRANK ROSE (in reply): I think Mr. Tilley is somewhat optimistic in his remarks. The patient appears well at present, but how long he will remain so I do not know. It is fifteen months since the last operation was done.

Laryngeal Cyst.—Cyril Horsford.—Patient, a male, aged forty-six, came to hospital with acute œdema of the left arytaenoid and aryepiglottic fold. There was loss of voice and dyspnoea. The swelling was scarified. At his next visit, the following week, all œdema had completely disappeared, and there was no evidence of disease which might explain the condition. The urine contained a slight trace of albumin. There were no tubercle bacilli in the sputum.

In August, 1916, the patient returned with a large cystic swelling involving the left ventricular band and left aryepiglottic fold and extending into the left pyriform fossa—an appearance exactly similar to the present condition. His dyspnoea was pronounced, and to relieve his distress the cyst was punctured with a cauterizing point. A large amount of blood-stained gelatinous fluid escaped. Until puncture was done it was impossible to punch out a portion of its wall, owing to its slippery surface and toughness. Although a large portion of its wall was removed, the cyst quickly refilled, and on two occasions has burst, with relief to the patient. There has been no material change during the past six months. Report of section cut by Dr. Bach: "Exact nature is obscure, but the material appears to be of an adenomatous nature, with a malignant tendency." A section is shown under the microscope. The urine is now free from albumin, and contains no casts. Wassermann reaction negative.

Suggestions as to treatment are invited.

Mr. HERBERT TILLEY: Two years ago I had to deal with a case which presented the same appearance as in Mr. Horsford's case. My patient nearly suffocated on two occasions, and one night he saved his life by putting his finger down his throat and bursting the cyst. It recurred and became distended again, when I opened it, and cut out a considerable quantity of the wall with laryngeal forceps; the symptoms disappeared, and a week later there was nothing to be seen of the tumour. However, in six weeks' time it was filling again, and one night he again nearly choked. In the mid-line of his neck, in the thyro-hyoid region, he had a swelling, which increased in size and became septic. We drained it for some time, but the fistula would not heal, and Mr. Trotter therefore took the case over for me, and will describe to you what he found. I think in Mr. Horsford's case the laryngeal cyst is probably an extension from the thyro-hyoid region, especially as Mr. Horsford's notes say that some gelatinous fluid escaped when the cyst was opened by him.

Mr. WILFRED TROTTER: When I first saw the man whom Mr. Tilley refers to, he had a chronic sinus in the front of his neck, over the thyroid cartilage, and I found it led down to and passed behind the ala

of the thyroid, in the region of the thyro-hyoid interval; hence I thought it was a thyro-glossal cyst. But instead of taking its way towards the middle line under the hyoid bone, it turned laterally and passed into the thyro-hyoid interval at the side, and went up, but chiefly downwards. We removed the ala of the thyroid until the cyst was traced to the level of the vocal cord. Internally to the cyst was the very thin mucous membrane of the larynx, and on the other side was the ala of the thyroid cartilage. I should not like to offer an opinion as to what the cyst was pathologically, but that was its anatomical distribution. It is clear that the swellings, which appeared first inside and then outside, communicated, and that the internal extension in the region of the upper opening had shrunk on account of inflammation. My advice would be to attack Mr. Horsford's case from the outside after removal of the ala of the thyroid.

MR. CYRIL HORSFORD (in reply): I am much interested in Mr. Tilley's case which he described, owing to its similarity to mine. I saw my patient sixteen months ago when he had what I took to be acute cedema of half his larynx; but it was not of globular outline, and it disease spread through the sphenoidal fossa, as shown by the complete ophthalmoplegia. I think Mr. Graham's method is ideal for approaching the ethmoidal cells, but otherwise I do not agree that it is an improvement, because there could not be a freer access to the antrum or to the fronto-ethmoidal cells than is secured by a Moure's operation; it is distinctly *en fosse* instead of being oblique.

Epithelioma of the Nasopharynx; Operation; Diathermy.—**Norman Patterson.**—Patient, a male, aged thirty-six. History of operation on nose five years ago, when a "piece of bone was removed." He was admitted to the London Hospital on November 15, 1916. He complained of obstruction on both sides of nose, thick discharge, and loss of smell for six months. There had been headache in the right forehead and temple for two months. He is losing flesh rapidly. An examination showed large, irregular, cauliflower-like mass, ulcerating in places, occupying the whole nasopharynx. There were no enlarged glands in the neck. There is slight deafness on the right side; no history of aural discharge. A portion of the tumour was removed and examined by Dr. Turnbull, who reported "solid trabecular squamous-celled carcinoma."

Operation, November 17, 1916: The soft palate was split. The incision was made from the right side of the base of the uvula. The view obtained was insufficient. The incision was carried forward through the mucous membrane of the hard palate to within 1 in. of the incisors; the posterior $\frac{3}{4}$ in. of the hard palate was removed with a chisel, also a portion of the posterior edge of the septum nasi. The attachment of the tumour defined with the finger was found to be more or less circular, occupying the roof and the right wall of the nasopharynx, and extending up to the base of the septum. The tumour was plucked away with the forceps close up to the attachment; hæmorrhage was stopped by pressure; the base of the growth was clearly defined. Together with surrounding tissues, this was thoroughly destroyed by diathermy. The palate was afterwards united.

The sense of smell returned three days after operation: recovery was uneventful. The palate is firmly united, and beyond some crusts there is nothing to note in the nasopharynx.

Antro-choanal Polypus.—**W. Jobson Horne.**—The patient, a woman, aged thirty-one, was sent to the hospital by her doctor on account of obstinate nasal catarrh of long duration. Anterior rhinoscopy disclosed material hypertrophy of the middle turbinal bodies, but no evidence of polypus or suppurative disease. Posterior rhinoscopy showed the post-nasal space to be almost entirely occupied by a polypus which became directly obvious upon partly raising the soft palate. The polypus was removed through the mouth. The anterior ends of the middle turbinal bodies were reduced. After the removal of the polypus the left choana was found to be wider than the right; the polypus originated from the left antrum. Upon transillumination the left antrum was as translucent as, or even more so than, the right. In the circumstances, it was considered to be better to await results than to open the antrum. The polypus, which was exhibited, was pear-shaped and attached by a pedicle as long and as firm as the polypus itself. The polypus upon section was solid with the exception of a small cavity. It was fibrous in consistency.

A Choanal Polypus originating in the Sphenoidal Sinus of a Child, aged Six.—**Irwin Moore.**—The patient, a girl, attended hospital in December, 1915, complaining of inability to breathe through the left nostril for three months. The exhibitor first saw her in May, 1916, when a large, flattened polypus completely filled the left nasal fossa. No nasal discharge was present.

On palpation of the nasopharynx, an irregular, hard swelling was felt protruding through the left choana. Under general anaesthesia the nasal portion was removed by forceps through the anterior naris, leaving a pedicle attached posteriorly, which was traced to its origin in the left sphenoidal sinus. The posterior portion was so tightly wedged in the left choana that forceps, introduced through the mouth, could obtain no hold. It was removed with difficulty through the anterior naris. On examination, the growth was found to consist of two polypi, originating by separate pedicles from one common stalk, the anterior portion being soft and gelatinous, the posterior being bilobed and of a fibrous consistence.

On exploring the posterior naris, the ethmoid region was found to be healthy and the antral wall intact. The posterior edge of the vomer was partly destroyed by the pressure of the growth. A large opening into the sphenoidal sinus admitted forceps, probes, or gouge with freedom. The sinus was about the size of a hazel nut. The right nasal fossa was normal.

It was apparent that the polypus had originated in the left sphenoidal sinus, and the main pedicle, which was flattened on one surface, had probably been adherent to the sphenoid-ethmoidal recess. The case was seen at King's College Hospital two weeks later by Sir StClair Thomson, who confirmed this opinion.

Microscopical Report.—The polypus is composed of highly vascular fibrous tissue which is cedematous. It is fairly rich in connective tissue cells and in the superficial areas there is some leucocyte infiltration, and also a good deal of mucoid degeneration. Mucous glands are very few in number. It is a soft fibroma.

This case is of interest in that :

(1) Though the maxillary antrum is the common seat of origin of choanal polypi, yet it is rare to find them in children under ten years of age, only a few cases being reported.

(2) It is extremely rare to find a choanal polypus originating in the sphenoidal sinus, and the exhibitor has been able to find only two cases reported, and these were in adults. He is unable to find the record of any case occurring in childhood.

(3) There was no suppuration in the sinus.

Dr. WATSON-WILLIAMS: Sphenoidal polypus is sufficiently rare to justify my showing, stereoscopically, this polypus growing from the sphenoidal sinus. I obtained the specimen from Vienna. Dr. Irwin Moore's case is one of very exceptional interest, proving that even in a young child polypus may occur in the sphenoidal sinuses. I am more and more convinced that sinus infection is more often present in young children than is usually suspected. I believe recurrences after adenoid operations are sometimes of this nature. A child was brought to me eighteen months after a tonsil and adenoid operation by a very competent operator, and when I explored the antral cavities of the child, which was aged five, with my antral suction syringe, there was antral streptococcal infection on the left side. I think it accounted for the re-infection of the lymphoid chain in the nasopharynx.

Dr. PELGER: I do not quite follow Dr. Watson-Williams in his view of a possible cause of recrudescence of lymphoid tissue in the nasopharynx (adenoids), and I imagine there is a much more frequent cause of recrudescence of a remnant of adenoid tissue than infection from sinus suppuration. With regard to Dr. Jobson Horne's case, very soon after Sir StClair Thomson showed his specimen at the last meeting I had a similar one, in a young woman aged twenty-one: it was a second recurrence. In the last instance it appeared to be a polypus attached to the roof of the choana, but on examining it again I could make sure it was a polypus protruding from the ostium of the antrum. I removed it through the nose, without difficulty, by seizing it securely with Luc's forceps, and drawing upon it gradually. This was three months ago, and there is no sign of recurrence. There was no suppuration.

Dr. IRWIN MOORE: With reference to Dr. Jobson Horne's case, and the question whether the antrum should be opened in these cases, I think that it should be made an invariable rule to open the maxillary antrum through the canine fossa in all cases of choanal polypi when their origin has been definitely located in the antrum, in order that one may be certain of separating and thoroughly removing the pedicle from its attachment to the antral wall. This is advisable on account of their frequent recurrence after simple removal by snare or forceps. In connection with these cases I have received letters from both Dr. W. S. Syme and Dr. Brown Kelly, who are unfortunately prevented by military duties from attending this meeting, the last-mentioned having, perhaps, seen more cases of antral polypi than anyone, and they both hold these views as to operative procedure. Dr. Syme sends me the following notes of an instructive case having an important bearing on this question. He says in January, 1908, he removed a solitary choanal polypus from a boy, aged nine. The polypus quickly returned, and in May of the same year he removed another large growth. In January, 1911, the patient was seen again, and another large choanal polypus was present. This time Dr. Syme opened the maxillary antrum and traced the polypus to its origin in the antral cavity. There was also degeneration of other parts of the antral lining membrane. Since this operation there has been no further trouble with that antrum. This is only one of many similar cases which have been reported and confirms the necessity of radical extirpation of these growths.

MR. E. D. D. DAVIS: I have investigated eight of these cases, two of them in children, and I have never found antral disease in any of them, though examined by transillumination and with the exploring syringe. The polypi have been removed, they have returned, and been removed again, and perhaps a third time, but I have not been able to establish the fact that there has been any disease of the antrum. The polyp grew from the middle meatus, they were post-nasal choanal polypi, and had a long pedicle. I do not agree that if you find the lotion aspirated from the antrum contains micro-organisms and no pus, it means that the antrum is diseased, because such organisms may normally exist in the nose, and contamination must frequently occur.

DR. WATSON-WILLIAMS: I did not say that the fact of organisms being in the fluid washed from the antrum proves that it is infected, but that the absence of purulent discharge on washing out the antrum does not prove that it is not affected.

MR. HERBERT TILLEY: With regard to the origin of these single choanal polypi (which often tend to become cystic and to burst when taken hold of) they generally have their origin within the antrum and seemed to occupy various laryngeal structures. I thought that if there was a cyst wall it must be very thin. But this wall is so tough that I had the greatest difficulty in punching out a portion. Within a week it had reunited and filled, and some further infection took place. It has been in its present condition seven months.

Sarcoma of Ethmoid and Superior Maxilla.—H. J. Banks Davis.—The patient is a male, aged thirty-nine. The disease first showed itself in the form of a swelling over the left antrum, with bulging and œdema of the palate. In February, 1916, the antrum, which contained pus, was opened, and as the growth was obviously malignant, after a preliminary laryngotomy, the left maxilla was partially resected, and a suitable obturator was worn by the patient for months. He had X-ray treatment from Dr. Morton for several months, and a photograph shows his appearance when treatment was discontinued.

The second photograph shows his condition in November last, when he returned saying he was blind in the left eye. I opened up the face again, curetted away masses of bone, but the patient refused to have the orbit cleared. Under treatment at the Radium Institute he improved very much, and was able to follow his profession.

Postscript.—A few days after his exhibition before the Section he was seized with severe pain accompanied by hæmorrhage. He then became blind in the other eye.

The last photograph shows his pitiable appearance a week before he died, after a third severe operation.

Radium treatment seemed powerless to arrest the rapidity of the growth in the later stages. It was a round-celled sarcoma.

Abstracts.

NOSE.

The Routine Examination in Cases of Nasal Accessory Sinusitis.—
John L. Sullivan. "The Laryngoscope," September, 1915.

Sullivan recommends that in every case (1) the nose should be examined before and after the application of cocaine and adrenalin. (2) The nose should be syringed with normal salt solution and the reappearance of pus looked for. (3) Transillumination. (4) X-ray examination, and comparison of the radiogram with the results obtained by transillumination. (5) Posture test for antrum and frontal, sphenoids, and ethmoids. (6) Proof puncture of antrum. (7) Probing and irrigation of frontal sinus. (8) Similar investigation of sphenoid and ethmoid. He admits that it is impossible at times to differentiate between disease of the posterior ethmoidal cells and disease of the sphenoid. He finds the long Killian speculum a help in the examination of this region.

Sullivan finds that a radiogram is not an infallible means of diagnosis. A plate may apparently show trouble in the frontal sinus, whereas at operation there is little or no disease.

Sullivan has found the Ballenger operation for exenteration of the ethmoid very satisfactory. In twenty cases he has had no complication, and he holds that the Ballenger operation is quite as safe as that devised by Mosher.

J. S. Fraser.

Chronic Frontal Sinusitis, Sphenoiditis, Meningitis; Death.—C.
Johnstone Imperatori. "The Laryngoscope," 1915, p. 580.

Male, aged twenty-six, brass-worker, had suffered for many years from ozena and tuberculosis of the left lung. A skiagram showed double frontal sinusitis, and the other accessory sinuses were also involved. A Killian operation was performed, and the sphenoidal ostium was also enlarged. The patient remained well for four years, but after that suffered from severe headache. The anterior wall of the sphenoid sinus was now removed. Later the patient complained of nausea, vomiting, and dizziness. The track leading to the frontal sinus was dilated, but a second operation of the left frontal sinus had to be performed and the sphenoidal cavity curetted. Three days later the patient had diplopia, followed by drowsiness. Temperature, 101° F. The patient suddenly became aphasic, and the right arm and right side of the face were paralysed. An exploratory operation was performed in the left temporal region but nothing was found. The posterior wall of the left frontal sinus was then removed and the brain explored, with negative results. After this the patient improved slightly, but later became comatose and died. *Autopsy:* Dura mater thickened and adhering to brain. Basal meningitis present, especially in the region of the sphenoid, where there was an abscess. The bone, however, appeared healthy. *No brain abscess.* Bacteriological examination of the cerebrospinal fluid showed a small bacillus resembling the influenza bacillus.

J. S. Fraser.

THYROID.

Acute Thyroiditis, complicated by Acute Adenitis.—C. F. Theisen.
 "New York State Journal of Medicine," December, 1913.

The author reports seven cases of this very interesting condition. He follows Mygind in designating as acute thyroiditis an inflammation of a gland previously healthy, in contrast to a similar inflammation in hypertrophied glands. In every case but one acute cervical adenitis was a precursor.

In two of the patients there was a recurrence; these two presented other remarkable points of resemblance, in that the second attack was preceded by a tonsillitis, and followed by a "diffuse goitre." Two cases had crises of hyperthyroidism with its complete symptom-complex. All seven patients were girls or adolescent women.

The medical treatment given was calomel at the onset of the illness, followed by a course of large doses of hexamethylenamine. The continuous use of an icebag was found invaluable in rapidly reducing the congestion. None of the cases suppurred. *H. Lawson White.*

ŒSOPHAGUS.

Foreign Bodies in the Œsophagus, Trachea, and Larynx.—F. Lugard.
 "Nord. Tidskr. f. Oto-Rhino-Laryng." Bd. 1, No. 1, p. 47.

The author mentions 15 cases of foreign bodies in the œsophagus (1 metal button, 1 horn button, 3 plum stones, 1 piece of meat, 1 piece of bone, 4 tooth-plates, 1 toy wheel of metal, 1 silver coin, 2 chicken bones), 1 case of foreign body in the trachea (a coffee bean), and 1 case of foreign body in the larynx (a piece of bone). The 15 cases first mentioned were all treated with the help of an œsophagoscope. In 10 cases the foreign body was taken away while in 5 cases it descended into the stomach and passed spontaneously through the rectum. In each case a cure was effected. In 1 case, a child aged one, in whose œsophagus the foreign body had lain for three months, a perœsophageal infection did arise but after several months' convalescence this patient also became well. In 4 cases there existed one or more strictures of the œsophagus caused by the patient having drunk a caustic.

A detailed reference is made to the diagnosis of foreign bodies in the gullet by means of Röntgen-rays. The author has carried out a few experiments in order to throw a light on this question. He placed various objects in his own œsophagus and then took photographs of the thorax. Some of the objects were photographed 20 cm. and some 25 cm. from the teeth. As a result of these experiments it is specially pointed out that objects of *rubber* and tooth-plates of vulcanite give a distinct image on the Röntgen plate. Objects of *glass* also appear clearly even if comparatively small (such as glass beads). In the case of *bone* objects it is necessary to be very careful in coming to a decision and especially in the case of the so-called bone buttons, as one cannot be certain as to the material of which the object in question is made. In the case of all kinds of objects, it is easier to attain a positive result when it has passed the upper part of the gullet and entered into the

comparatively transparent region between the vertebral column and the heart, the foreign body being more easily hidden in the upper part of the gullet, especially by the clavicle. Attention is drawn to the fact that one may mistake a group of calcined glands for a foreign body if one is not very exacting as regards the appearance of the Röntgen shadow.

The foreign body in the trachea was removed by Uchermann's "Bean Spoon" after tracheotomy.

Author's Abstract.

MISCELLANEOUS.

The Common Speech Disorders of Childhood.—John Priestly. "Brit. Journ. of Children's Diseases," vol. xiii, no. 148, April, 1916.

Priestly, who has had the opportunity of examining 20,000 school children per annum for three years divides the speech disorders of childhood into two main varieties, accidental or those due to anatomical or pathological anomalies and essential. These main varieties might have been more aptly classified as organic and functional. The essential variety is divided into defects of articulation and stammering with its allied conditions. Articular defects are subdivided into idioglossia when the defect is universal and all consonants are blurred and lisping when it is partial and affects the pronunciation of s, g, l, and r, and sounds dependent upon the action of the soft palate. In stammering and its subdivisions there is inco-ordination, embarrassment, or paralysis of the speech mechanism. Stuttering is a form of stammering in which the individual instead of dwelling on the blocked point perpetually, harks back in the hope of a more successful "jump off." Spluttering is a runaway or tempestuous form of speech, the converse of stammering.

Speech mechanism is made up of primitive instinctive sounds, a combination of these into words, and the co-ordination of words for purposes of expression. Lisping and idioglossia are defects in the first two of these and stammering of the third. Idioglossia and lisping show a marked decline in the older school children whereas the percentage of stammerers, in spite of many cases of spontaneous cure, tends to increase in the older children.

As regards treatment the defects of articulation are best controlled by practical demonstration and example. Frequent short lessons are advisable to stimulate the natural growth of the imperfect organ. As regards stammering the author doubts the efficacy of the diverse methods commonly recommended, and considers a study of the individual nervous and temperamental condition of the patient to be of supreme importance. Except as a sort of placebo the patient's attention should not be focussed on his respiratory movements or the phonetics of individual sounds. No two cases require quite the same treatment, but in all cases the teacher must have infinite patience and be capable of inspiring and maintaining the patient's confidence as to the ultimate result.

J. B. Horgan.

A Fatal Case of Ulcero-membranous Angina.—Ira Frank. "Annals of Otology, etc.," xxv, 631.

The cases reported are two in number, a male, aged forty-eight, and a female, aged twenty-two. The former began five weeks previously with a peritonsillar abscess, and was admitted in a very weak and emaciated

condition, with an area of deep necrosis on the right side of the soft palate. Bacteriological examination showed pneumococci, a fusiform bacillus, and spirilla (predominating). The treatment adopted was frequent gargle of peroxide, with daily deep injections of sodium cocodylate. He improved on the third day, and healing began on the fifth day. The course of the entire process was ten weeks, six of which were spent in hospital.

The second and fatal case had complained for one week of severe sore throat, with almost total dysphagia. Bacteriological examination showed large numbers of fusiform bacilli and spirilla. The right tonsil was covered by greenish grey membrane, adherent and tough. Treatment was similar to that of the first case. She got much worse, showing signs of collapse on the second day. On the fourth day she had severe retching, and vomited a cast of the œsophagus. Next day she coughed, and became cyanotic, forcibly expelling membrane from the trachea and larynx. During the four following days she became worse, and became convinced of impending death. A fatal result occurred two days later.

The cases, so malignant clinically, were markedly different in type. The first, ulcerative and necrotic, with no systemic effects, no temperature, and responding readily to treatment. The second, membranous, with toxic symptoms, fever, nephritis, and myocarditis, and resisting treatment. The author thinks the slow ulcerative type was a chronic and the membranous type an acute or fulminating infection. The suggestion that the difference was due to the predominance of either the spirilla or the fusiform bacilli was untenable. "The fulminating character of the second case might well be ascribed to infection with virulent organisms in a host physically unfit to offer resistance and combat the process." The first case showed no more systemic effect than would a walled-off abscess: the second showed systemic effect due to (1) virulent infection, (2) absorption in the large area involved, and (3) consequent secondary infection.

Macleod Yearsley.

THE LATE DR. JULES BROECKAERT.

IN addition of the acknowledgments already made in the JOURNAL OF LARYNGOLOGY, RHINOLOGY, AND OTOTOLOGY we gratefully own receipt of £15 10s. (kr. 250), forwarded to us on behalf of the Oto-laryngologists of Norway by Dr. Kund Fleischer.

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THE MORBID ANATOMY OF WAR INJURIES OF THE EAR.

BY J. S. FRASER, M.B., F.R.C.S.E., AND JOHN FRASER, M.D.,
F.R.C.S.E., CAPTAIN, R.A.M.C.

(Continued from p. 353.)

CASE 3.—SHELL DEAFNESS.

This soldier was taking cover in a house when a high-explosive shell hit the house and burst into the room in which he was. The patient was wounded in many places. On admission to the Casualty Clearing Station the patient was found to be semiconscious with subnormal temperature, small rapid pulse, cold clammy skin and multiple small wounds. In fact, he showed the usual signs of high-explosive shell injury, including marked deafness. He died twenty-four hours later from shock.

Naked-eye examination showed a large ragged hole in the anterior part of the left tympanic membrane. The inner wall of the tympanic cavity was seen to be congested. The mastoid antrum and air-cells appeared to be normal along with the Eustachian tube, saccus, jugular bulb, and carotid canal.

Microscopic Examination.

Drumhead.—This is ruptured in the anterior inferior part. The edges of the rupture are everted and show a little hæmorrhage. The rupture extends as far as the handle of the malleus.

Middle-ear Spaces.—There is a little hæmorrhage in the floor of the tube, in the niche of the round window, and also on the promontory. There is slight bleeding in the air-cells in the roof of the mastoid antrum and also in the border cells between the aditus and the external meatus. The tympanic ossicles and muscles are healthy. The oval window and the facial nerve are normal.

Hollow Spaces of the Labyrinth: (1) Cochlea.—The scala tympani and the scala vestibuli are healthy. Corti's organ is well-formed; the pillar cells and other supporting cells are well seen, but the hair-cells



FIG. 11 (Case 3).—High-explosive shell injury of ear. Horizontal section, No. 60, $\times 6$ diam. Shows hæmorrhage in border cells and also in air-cells on inner wall of antrum. 1, malleus; 2, incus; 3, external meatus; 4, blood in "border" cell; 5, lateral canal; 6, blood in air-cell; 7, two ends of superior vertical canal [the nearer (smooth) end contains bone chips—artefact].

are not visible. The nerves in the modiolus and the spiral ganglion are normal.

(2) *Vestibule.*—The utricle, saccule, and endo-lymphatic duct, along with the peri-lymph spaces, all appear to be healthy.

(3) *Canals.*—These appear to be normal, along with the nerves supplying the cristæ.

Internal Meatus and Nerves.—The vestibular ganglion is healthy, but there are small hæmorrhages in the fundus of the internal meatus, where the branches of the cochlear nerve to the basal coil enter the modiolus, as well as in the narrow canal for the nerve to the ampulla of the posterior canal.

(See Figs. 11 to 17.)

Summary.

This case of high-explosive shell injury of the ear shows certain

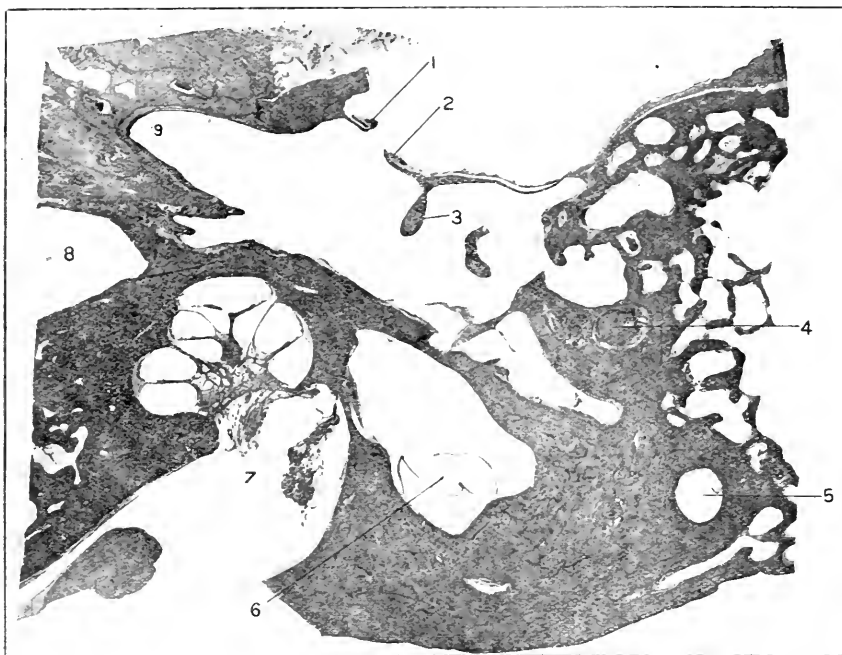


FIG. 12 (Case 3).—High-explosive shell injury of ear. Horizontal section, No 200, $\times 6$ diam. (hæmatoxylin and eosin). Shows rupture of anterior part of drumhead with everted edges. 1, anterior portion of ruptured drumhead (everted); 2, posterior margin of rupture, also everted; 3, malleus; 4, facial nerve with stapedius to the left; 5, smooth end of posterior vertical canal; 6, lower part of utricle with crista quarta; 7, internal meatus; 8, carotid canal; 9, tubal part of tympanum.

definite changes—viz. rupture of the tympanic membrane, slight hæmorrhage in the middle-ear spaces and in the fundus of the internal auditory meatus. The structures of the membranous labyrinth show normal conditions.

CASE 4.—INJURY TO THE EAR DUE TO THE BURSTING OF A RIFLE GRENADE.

The grenade burst close to the left side of this soldier and caused extensive general injury. (Rifle grenades, though much smaller than shells, contain a very powerful form of high explosive.—J. Fraser.)

Microscopic Examination.

Drumhead.—This is ruptured in the lower part posteriorly, but the edges of the perforation are for the most part glued together by blood-clot (Fig. 25).

Tympanic Cavity.—There is hæmorrhage in the marrow spaces, in the roof of the tympanic cavity, and there is a little blood in the tympanum itself in the angle between the drumhead and the malleus. The ossicles and the joints are normal, but there is slight hæmorrhage

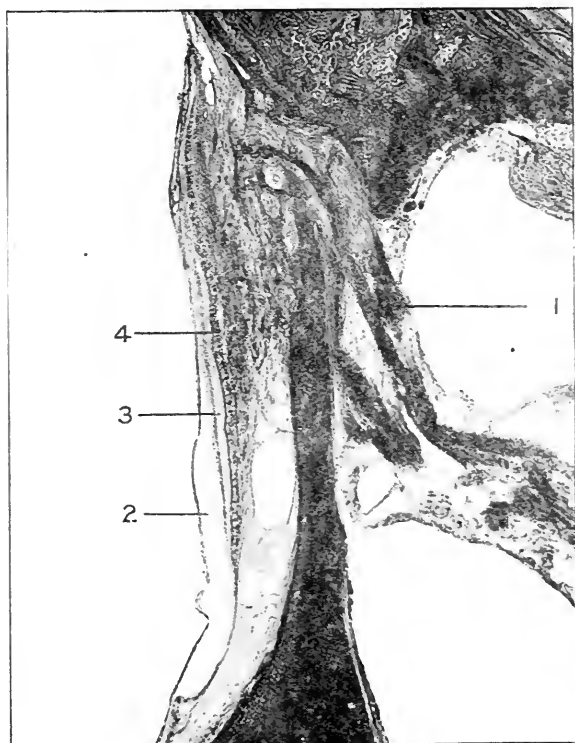


FIG. 13 (Case 3).—High-explosive shell injury of the ear. Horizontal section, No. 203, $\times 33$ diam. (iron-hæmatoxylin). Shows normal condition of sacculus. 1, nerve to saccule; 2, cavity of saccule; 3, otolith membrane; 4, neuro-epithelium of saccule.

in the canal for the tensor tympani. On the inner wall of the tympanic cavity there is some effused blood around the geniculate ganglion. The structures in the oval and round windows are normal.

Labyrinth Capsule.—There is a small hæmorrhage in the fossa sub-arcuata, but otherwise the labyrinth capsule is healthy.

Labyrinth Contents: (1) *The Cochlea.*—The outline of Corti's organ is preserved, but many of the cells—not only the hair-cells but also the supporting cells—have disappeared, so that Corti's organ appears rather like a ghost or skeleton. The epithelial cells of the stria vascularis

appear to be detached from the spiral ligament in the basal and middle coils. There is blood in the scala tympani in the region of the round window.

(2) *Vestibule*.—The otolith membrane of the saccule is separated and the neuro-epithelium irregular. The aqueduct of the vestibule is normal.

(3) *Canals*.—The cupula of the superior canal is separated, but the ampulla of the posterior canal is normal.

Internal Meatus.—There is extensive hæmorrhage in the fundus of

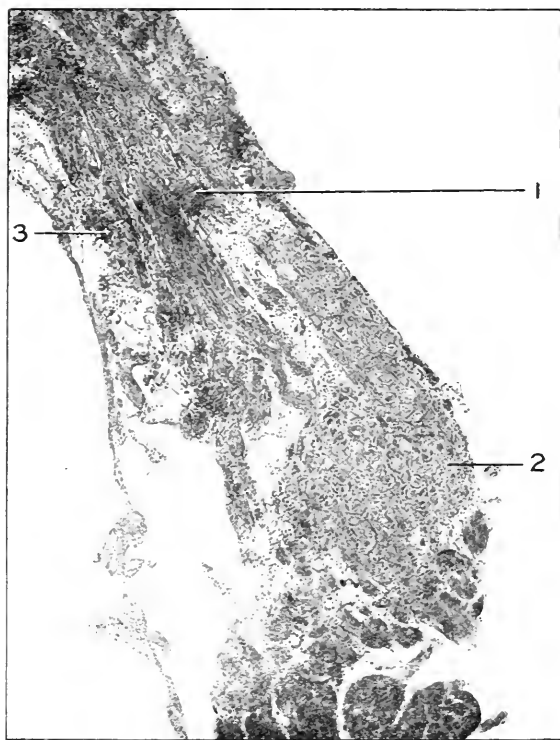


FIG. 14 (Case 3).—High-explosive shell injury of the ear. Horizontal section, No. 203, $\times 48$ diam. (iron-hæmatoxylin). Shows hæmorrhage in vestibular nerve and normal condition of ganglion in the internal auditory meatus. 1 and 3, hæmorrhage between fibres of vestibular nerve; 2, vestibular ganglion (normal).

the internal meatus, and there is also some blood in the bony canal which contains the branch of the vestibular nerve for the crista of the lateral canal. There is also a considerable amount of blood pigment in the internal meatus.

(See Figs. 18 to 24.)

Summary.

The changes in this case of ear injury due to grenade explosion are fairly definite, and include a recent rupture of the tympanic membrane,

the edges of which are partially glued together by fibrin. Further, there are hæmorrhages in the tympanic cavity, in the marrow spaces in the roof of this cavity, around the geniculate ganglion, and in the fossa subarcuata. There is also bleeding in the scala tympani of the cochlea in the region of the round window. There is a marked hæmorrhage in the fundus of the internal meatus. The otolith membrane of the saccule



FIG. 15 (Case 3).—High-explosive shell injury of the ear. Horizontal section. No. 203, $\times 38$ diam (iron-hæmatoxylin). Shows condition of Corti's organ in apical and middle coils: except for the absence of the hair-cells, due to faulty fixation of the specimen (?), there appears to be little change in the acoustic papilla.

is separated and the neuro-epithelium is irregular, while the cupula of the superior canal is also separated. Although the outline of Corti's organ is preserved, the hair-cells and some of the supporting cells cannot be made out, so that the organ appears ghost-like. (These appearances in the neuro-epithelium of the labyrinth may possibly be due to *post-mortem* change, but, in our opinion, they are more probably due to "degenerative neuritis" of the nerve structures of the inner ear.) In this case the stress of the explosion appears to have been exerted on the posterior inferior part of the drumhead, the region of the round window, and the fundus of the internal auditory meatus.

CASE 5.—SHELL EXPLOSION.

The patient suffered from severe concussion, and the right side of the head and body presented multiple wounds.

Naked-eye examination of the ear showed a plug of wax in the right external auditory meatus. The right drumhead appeared lustreless, opaque, and indrawn after the wax had been removed.

Microscopic Examination.

The drumhead appears to be unusually thick, but is otherwise normal.



FIG. 16 (Case 3).—High-explosive shell injury of the ear. Horizontal section, No. 203, $\times 38$ diam. (iron-haematoxylin). Shows normal (?) condition of Corti's organ in upper part of basal coil.

Middle-ear Spaces.—There is slight hæmorrhage in the tubal part of the tympanic cavity and on the inner wall of the middle ear. The tympanic ossicles and joints are normal. The footplate of the stapes shows a congenital dehiscence in the bone, filled with connective tissue. The niches of the oval and round window are healthy.

Hollow Spaces of the Labyrinth: (1) *Cochlea.*—There are small, round masses of hyaline substance in the scala tympani and scala vestibuli, but these are probably of little importance. Corti's organ shows a normal outline in all coils. The hair-cells cannot be made out,

but this, of course, is not unusual in *post mortem* specimens. The cochlear opening of the perilymphatic aqueduct is normal, but towards the cranial end the aqueduct contains a little hæmorrhage.

(2) *Vestibule*.—The otolith membrane of the utricle is raised up from the neuro-epithelial cells (artefact?). The saccule and its otolith membrane are normal. The ductus endolymphaticus is healthy.

(3) *Canals*.—The cupula of the external canal is misplaced, as is also that of the superior canal, otherwise these canals are healthy. The crista of the posterior canal is healthy.

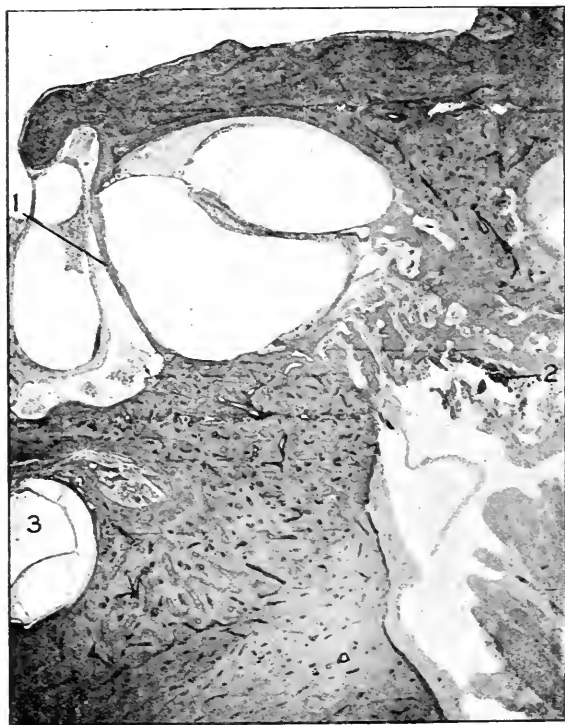


FIG. 17 (Case 3).—High-explosive shell injury of ear. Horizontal section, No. 265, $\times 11$ diam. (hæmatoxylin and eosin). Shows region of round window and fundus of internal meatus with hæmorrhage. 1, Membrane of round window; 2, hæmorrhage in internal meatus; 3, ampullary end of posterior vertical canal.

Internal Meatus.—The facial nerve is healthy. There is some hæmorrhage in the fundus of the meatus around the cochlear nerve.

Summary.

The changes in this case are very slight. This may possibly be explained by the presence of a plug of wax in the external meatus. There are small hæmorrhages in the tubal part of the tympanic cavity, in the canal for the tensor tympani, in the cranial ends of the fossa subarcuata and perilymphatic aqueduct, and in the fundus of the

internal meatus. The neuro-epithelium of the labyrinth shows little change, but the detachment of the otolith membrane of the utricle and of the cupulæ of the lateral and superior canals is worth recording. If a similar condition were found in the labyrinths of other patients who had suffered from shell explosion, these conditions might be regarded as of importance.

CASE 6.—INJURY BY HIGH-EXPLOSIVE SHELL.

This soldier caught the full blast of a high-explosive shell, which burst close to his left side and shattered this side from head to foot.

Naked-eye Examination.—Left tympanic membrane shattered, only the outer margin remaining attached to the annulus. The malleus



FIG. 18 (Case 4).—Injury of left ear due to bursting of rifle grenade. Horizontal section. No. 125, $\times 14$ diam. (hæmatoxylin and eosin). Shows crista of lateral canal and displaced otolith membrane of utricle. 1, facial nerve; 2, upper part of utricle with, 3, detached otolith membrane; 4, ampullary end of lateral canal.

appears to be pushed inwards with a piece of membrane attached to it. The long process of the incus can be seen through the perforation. The inner wall of the tympanum presents a reddish-brown appearance, but there is little evidence of blood in the antrum. The superior canal appears normal when opened to admit the fixing fluid.

Microscopic Examination.

Tympanic Membrane.—There is a large gap in the drumhead in front of, below and behind the handle of the malleus, but there is no



FIG. 19 (Case 4).—Injury of left ear due to rifle grenade. Horizontal section, No. 225, $\times 14$ diam. (hæmatoxylin and eosin). Shows oval window with stapes; displacement of otolith membrane of saccule; desquamation of neuro-epithelium. 1, foot-plate of stapes; 2, neuro epithelium of saccule; 3, detached otolith membrane.



FIG. 20 (Case 4).—Rifle grenade injury of left ear. Horizontal section, No. 230, $\times 48$ diam. (iron-hæmatoxylin). Shows, 1, shrunken (?) condition of cells of spiral ganglion of middle coils.



FIG. 21 (Case 4).—Rifle grenade injury of left ear. Horizontal section, No. 230, $\times 48$ diam. (iron-haematoxylin). Shows irregular condition of neuro-epithelium of saccule and loss of otolith membrane.

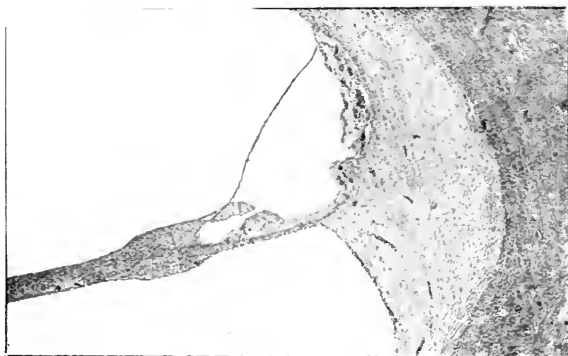


FIG. 22 (Case 4).—Injury to left ear due to rifle grenade. Horizontal section, No. 230, $\times 48$ diam. (iron-haematoxylin). Shows condition of Corti's organ in upper part of basal coil. The epithelial cells are irregular and do not stain well, and the stria vascularis is desquamated.

rupture of Shrapnell's membrane. The lower part of the handle of the malleus, with a piece of membrane attached, is in contact with the promontory.

Middle-ear Spaces.—The *Eustachian Tube* contains hæmorrhage.



FIG. 23 (Case 4).—Injury to left ear due to rifle grenade. Horizontal section, No. 230, $\times 48$ diam. (iron-hæmatoxylin). Shows condition of Corti's organ in lower part of middle coil. The epithelial cells and the vessels in the bony spiral lamina stain badly.

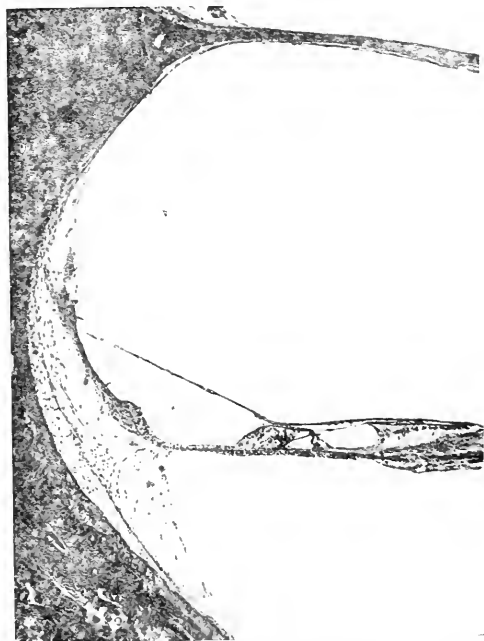


FIG. 24 (Case 4).—Cochlear canal with Corti's organ from middle coil of cochlea in an old man aged 80, who suffered from nerve deafness. It will be seen that the acoustic papilla is well formed. (This specimen is shown for comparison with those obtained from Cases 3, 4, 5, and 6, in which the ears had been subjected to concussion caused by shell or rifle-grenade explosion.)

The head of the malleus is healthy, and the joint between the malleus and incus is normal, as is also that between the incus and stapes. The stapes footplate appears to be somewhat displaced, and the posterior part of the annular ligament is ruptured (artefact?). The posterior part of the footplate of the stapes is tilted outwards towards the tympanic cavity (artefact?).

Hæmorrhage is present on the inner wall of the attic, and also between the short process of the incus and the outer wall of the aditus. Free blood is also seen in Prussac's space. In the lower part of the cavity the inner wall shows a layer of hæmorrhage, and the niches of the oval and round windows are full of blood. The lining membrane of the tympanic cavity is congested and slightly swollen. The sinus

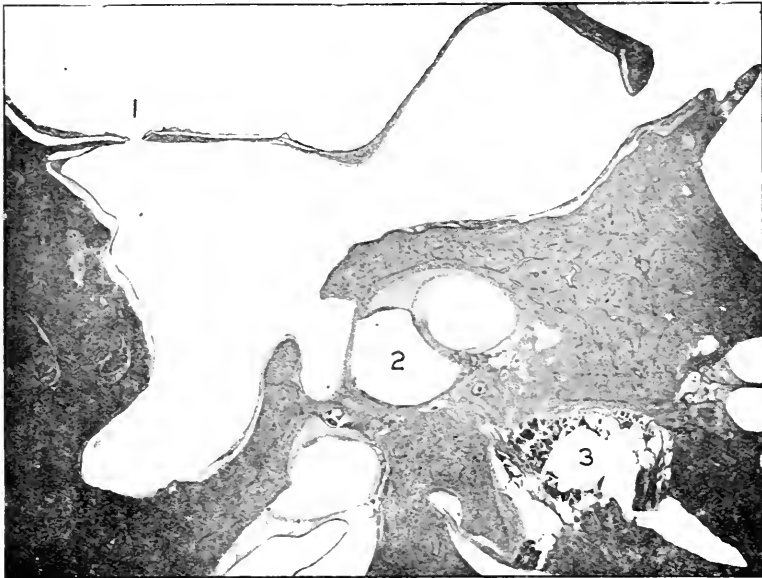


FIG. 25 (Case 4).—Injury to left ear due to explosion of rifle grenade. Horizontal section. No. 305, $\times 9$ diam. (hæmatoxylin and eosin). Shows, 1, rupture of drumhead with blood clot on anterior margin; 2, scala tympani just internal to round window membrane with thin layer of hæmorrhage on the walls; 3, fundus of internal meatus with hæmorrhage.

tympani also contains blood. The membrane of the round window appears normal.

Hæmorrhage is present in the cells in the roof of the antrum, and in the border cells between the antrum and external meatus. There is a little free blood in the floor of the aditus.

Labyrinth Capsule.—There is some hæmorrhage in the canal for the great superficial petrosal nerve. The vessels of the fossa subarcuata are dilated.

Labyrinth Contents: (1) *Cochlea.*—Owing to a fault in the first embedding of the specimen, air entered the hollow spaces of the labyrinth, and in the second embedding the evacuation apparatus was used to extract the air. It is therefore impossible to speak with any degree

of certainty regarding the condition of the nerve structures. The intravestibular and apical portions of the cochlear canal are more normal than the middle portions, but this may be due to the fact that the latter was more affected by the suction apparatus, which was only applied after the basal coil of the cochlea had been opened. The cochlear opening of the perilymphatic aqueduct is normal.

(2) *Vestibule*.—The neuro-epithelium of the utricle and saccule appears healthy. The aqueduct of the vestibule is normal, and the ductus endolymphaticus is quite healthy.



FIG. 26 (Case 5).—Injury (?) of right ear due to shell explosion (the right meatus contained a large plug of wax). Horizontal section, No. 95, $\times 19$ diam. (hæmatoxylin and eosin). Shows displacement of cupula of lateral canal—artefact?

(3) *Canals*.—The superior canal is normal, except that in the ampulla the epithelium is irregular (artefact). The cristæ of the external and posterior canals are normal.

The internal meatus and nerves show no hæmorrhage nor other abnormality.

Summary.

In this case the force of the explosion seems to have been expended in rupturing the drumhead, so that the structures of the inner ear



FIG. 27 (Case 5).—Injury (?) of right ear due to shell explosion. (The right meatus contained a large plug of wax.) Horizontal section through the vestibule. Shows the normal condition of the saccule with otolith membrane intact.

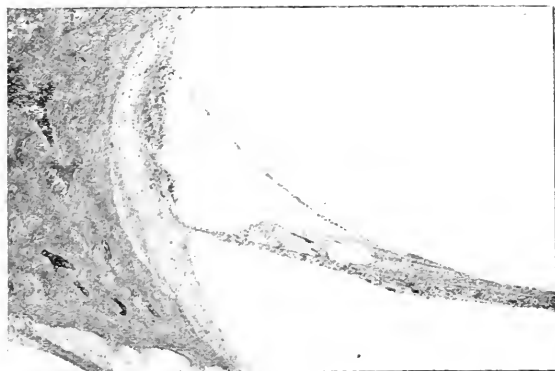


FIG. 28 (Case 5).—Injury (?) to right ear due to shell explosion. (The right external meatus contained a large plug of wax.) Horizontal section through cochlea showing normal (?) condition of Corti's organ in middle coil.

along with the nerves in the internal meatus, have escaped. Owing to a fault in the first embedding of the specimen, air was present in the hollow spaces of the labyrinth, and it is therefore unwise to be dogmatic as to the condition of the membranous labyrinth. The rupture of the saccule and of portions of the membranous cochlea are probably artefacts produced by the use of the suction apparatus. The rupture of the posterior part of the annular ligament may also be due to the same cause.

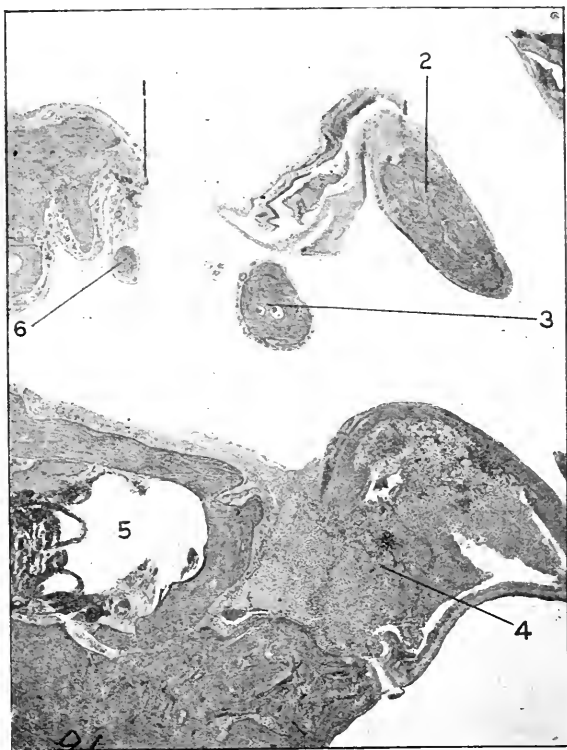


FIG. 29 (Case 6).—Injury of left ear due to high-explosive shell. Horizontal section, No. 285, $\times 15$ diam. (hæmatoxylin and eosin). Shows rupture of drumhead in front of and behind the malleus. The niche of the oval window and the hollow of the stapes contain blood. 1, posterior part of ruptured drumhead; 2, malleus; 3, incus; 4, blood in hollow of stapes; 5, facial canal (the nerve is displaced—artefact); 6, chorda tympani.

CONCLUSION.

The only changes of importance found in the four cases of "explosion" injury of the ear are: (1) Rupture of the drumhead (Cases 3, 4, and 6) and hæmorrhage into the middle-ear spaces; (2) hæmorrhage in the fundus of the internal meatus in three of the four cases. In Cases 3 and 5 the neuro-epithelial structures of the labyrinth appear to be normal. In Case 4 the changes are possibly of "*post-mortem*"

origin, but they appear to us to be due rather to an early stage of "degenerative neuritis," while in Case 6 they are caused by a fault in the preparation of the specimen. It seems quite possible that in many cases of "shell" or "explosion" deafness we have to deal with a functional affection, as suggested by Milligan and Westmacott. On the other hand, rupture of the drumhead and hæmorrhage into the middle-ear spaces must cause a certain loss of hearing; while hæmorrhage in the fundus of the internal meatus may give rise to deafness, tinnitus, giddiness, and other symptoms of an inner ear lesion. It may be that the "blow" to the ear due to shell explosion, and the associated loud sound, paralyses the delicate nerve-endings of the auditory apparatus, but we cannot claim to have demonstrated this microscopically, except

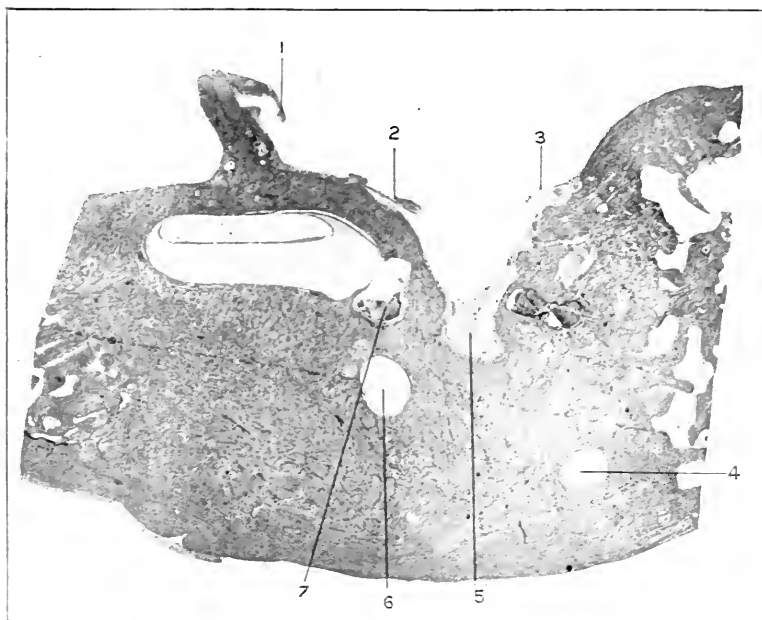


FIG. 30 (Case 6).—Injury of left ear due to high explosive shell. Horizontal section, No. 410, $\times 6$ diam. (hæmatoxylin and eosin). Shows large rupture of drumhead. The central part of the membrane is in contact with the promontory. There is hæmorrhage in the niche of the round window. 1, anterior part of ruptured drumhead; 2, central portion of drumhead in contact with promontory; 3, posterior part of drumhead; 4, smooth end of posterior vertical canal; 5, blood in sinus tympani; 6, ampullary end of posterior canal; 7, blood in niche of round window.

possibly in Case 4. As we have already said, microscopic examination of the ears from cases of shell-deafness, which die from other causes years after the injury, would be of great value in clearing up the pathology of the condition, and especially in throwing light on the question of "degenerative neuritis" of the cochlear apparatus.

The writers wish to thank Mr. Richard Muir for the photo-micrographs which illustrate this paper. They also acknowledge a grant from the Carnegie Trust in payment of the expenses incurred in reproducing the illustrations.

FOREIGN BODY IN THE RIGHT MAXILLARY ANTRUM FOR TWENTY-FIVE YEARS, CAUSING FACIAL NEURALGIA, DISCOVERED BY X RAYS, AND REMOVED BY OPERATION THROUGH THE CANINE FOSSA, WITH SOME REMARKS ON FOREIGN BODIES IN THE MAXILLARY ANTRUM.

By IRWIN MOORE, M.B., C.M. Edin.,

Surgeon to the Throat Hospital, Golden Square, W., etc.,

JOINTLY WITH PERCY MILLICAN, L.D.S. Eng.

THIS remarkable case,¹ shown at the meeting of the Royal Society of Medicine (Laryngological Section) on November 3, 1916, is worthy of notice in view of the fact that it is the first one recorded in which a foreign body has remained in the maxillary antrum for a quarter of a century without being discovered or giving rise to suppuration; also in which the antrum was not even suspected of being the origin or seat of the accompanying facial neuralgia.²

REMARKS BY MR. MILLICAN.

The patient, a lady aged sixty-seven, consulted me in September, 1916, complaining of facial neuralgia of twenty-five years' standing. I found the two upper central incisors (which were the only two teeth standing in the upper jaw) loose and septic, also the left lower premolar roots, and these I extracted. Since the patient's general appearance gave me the impression that she was troubled with ceaseless pain, I went carefully into the history of her case, and obtained the following information:

While residing in the West Indies in 1891 she had the right first upper molar extracted under local anæsthesia, followed by very severe pain under the right eye, from which she has never been entirely free. In 1897 she had a nervous breakdown, and a "lump" was said to have been felt over the right maxillary antrum, accompanied by much pain and tenderness. In consequence, the remaining upper molars were extracted. In 1901 the patient came to England and consulted a throat specialist, without any avail. She returned to the West Indies, seldom free from pain, with occasional exacerbations. In 1911 she went to New York, and had the right infra-orbital nerve resected. In 1913, while residing at Bexhill, following another acute attack of pain, she noticed that the "lump" was loose and moved about. Recently she has been treated by means of alcoholic injections.

From this history I had to make a diagnosis, and the patient's accurate description of the pain was most helpful. Bearing in mind that for many years she had been treated for trigeminal neuralgia, it was at once evident to me that this diagnosis was wrong, because—

(1) The pain she described was sharp, pricking, and intense. It was not neuralgic.

(2) It was entirely confined to the region over the right maxillary antrum. There was an entire absence of pain in the corresponding eye and ear, neither was there any redness of that side of the face.

¹ See Irwin Moore: "Proc. Roy. Soc. Med." (Laryngological Section), 1916, x, pp. 26-29.

² The term "neuralgia" is used here in a general sense to indicate pain.

(3) The commencement of the pain was connected with the extraction of the right first upper molar tooth, the anterior buccal root of which is often intimately related to the maxillary antrum.

She described the pain as being of two kinds—namely:

(1) The sharp, pricking sensation as described above.

(2) A "lump sensation," fixed at first, movable afterwards. This "lump sensation" made me strongly suspect a foreign body in the right maxillary antrum—possibly the anterior buccal root of the above-men-

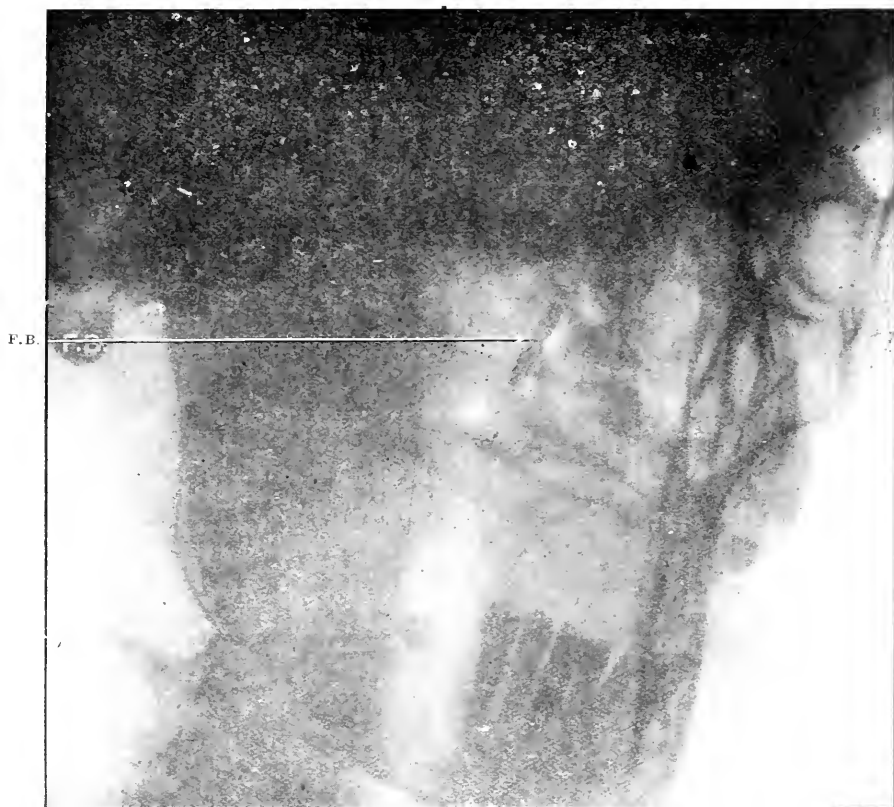


Fig. 1.—Radiogram showing the piece of metal in the right maxillary antrum

tioned molar. I therefore sent her to Mr. Charles Clark, L.D.S., and suggested that he should obtain a radiograph of the right antrum.

The radiogram showed a foreign body in the right maxillary antrum, lying against the nasal wall. It appeared to be cylindrical in shape, about 1 in. in length and $\frac{1}{8}$ in. in diameter (Fig. 1). In view of this discovery, I took her on October 12 to consult Dr. Irwin Moore.

REMARKS BY DR. IRWIN MOORE.

I was asked to see this patient in consultation. There was no history of nasal catarrh or suppuration, and both nares were found to be perfectly normal and healthy.

On inspecting the radiogram (Fig. 1) it was apparent that a rod-shaped body was present in the right maxillary antrum, and I advised that the antrum should be opened and search made for the foreign body. Two days later, under an anæsthetic, I opened the antrum through the canine fossa (Fig. 2), and found a piece of aluminium wire (Fig. 3) lying loose in the angle formed by the meeting of the posterior and inner walls. The lining membrane of the antrum was found to be perfectly healthy.



Fig. 2.—Shows the operation through the canine fossa. The piece of metal is seen lying in the antrum.

The foreign body was cylindrical in shape, and from the analysis and measurements made by Mr. Millican, proved to consist of pure aluminium, having a length of 1.34 cm. = .528 in. (just over $\frac{1}{2}$ in.), and a diameter of 0.29 cm. = 0.114 in. The specific gravity was 2.666, and the weight was .024 gm. = 3.69 gr. One extremity was smooth, whilst the other appeared to have been cut by pliers. This piece of metal had apparently been buried or fixed for twenty-five years, and (as suggested by the patient's symptoms) only became loose and movable in the antrum three years ago.

This case is of great interest in showing that—

(1) The maxillary antrum will tolerate a foreign body for twenty-five years without causing catarrh or suppuration.

(2) The shadow of this rod-shaped body could be distinctly seen when the antrum was transilluminated.

(3) The appearance of the aluminium foreign body by X ray (according to the opinion of expert radiographers) was not compatible with its metallic nature.

(4) Cases of facial neuralgia may be treated for years without any suspicion of their being caused by antral trouble.

(5) The progress which has been made during recent years in radiography has been of great service in the diagnosis and treatment of diseases of the accessory sinuses of the nose.

(6) Co-operation of the rhinologist with the dental surgeon may be of inestimable value in the treatment and cure of diseases of the maxillary antrum.

Text-books make practically no reference to foreign bodies in the accessory sinuses. They are not common, and when they occur the maxillary antrum is the most likely site. They generally consist of broken surgical or dental instruments, such as probes, cannulae, dental burs, or drainage-tubes, which have been discovered either by means of



Fig. 3. — The piece of aluminium. (Natural size.)

X rays in connection with persistent catarrh or suppuration of that cavity, or during operative procedures. They are generally introduced by artificial openings, and seldom enter by the natural ostia. Broken and diseased teeth are not infrequently forced into the antrum during attempts at extraction.

Newcomb¹ has compiled a list of foreign bodies in the maxillary antrum from 1891 to 1910, and found that 50 cases had been recorded by forty-six observers.

It is only to be expected that the greater number of these cases occurred in patients suffering from suppuration of the maxillary antra, who had been operated upon by the old-fashioned and now out-of-date method through the alveolar route, where, during after-treatment, an obturator, antral tube or cannula had accidentally slipped into the cavity owing to separation of its flange. Of such cases 16 have been reported; of tooth and tooth-roots there have been 13; bullets, 6; gauze compresses accidentally left in during operation, 2; pipe-stems, 2; and 1 each of cotton, piece of paper, wood, tooth-pick, straw, rubber nipple, obturator, glass, peg, and piece of a broken metal bolt.

¹ Newcomb: "Trans. Amer. Laryngol. Assoc.," 1911, pp. 106-109.

Razemon¹ has reviewed in detail 29 of these 50 cases, and found 10 were teeth, calculi, or bony sequestra, 9 projectiles of various descriptions, whilst 10 were discovered only during operative treatment for antral suppuration.

In some cases the mode of introduction was unknown, whilst in others no further symptoms were added to the previous existing disease.

Skiagram taken in 10 of these cases showed positive results in 7. X rays have not, however, always located rubber tubes or obturators. Newcomb,² amongst others, has reported a case where X rays failed.

Zemann³ reports the case of a soldier from whose antrum he extracted a bullet weighing 13 grm.—by the lateral nasal wall route.

Ogilvie Will and McKenzie Davidson⁴ report one case where a bullet lodged in the antrum was located by telephone.

Tilley⁵ has recorded a case where he found a tooth lying on the floor of the right maxillary antrum during a radical operation for naso-antral polypus accompanied by suppuration of the cavity.

Ingersole⁶ (Cleveland) reports a case in which there was persistent neuralgia over the right antrum, though the teeth were all in good condition, and the nose was normal. The patient died of pneumonia, and autopsy showed a fairly well-developed molar tooth in the posterior wall of the right antrum just above the floor. The crown projected into the antrum, and the roots were embedded in the antral wall.

A radiogram would have diagnosed this condition, and co-operation with a skilled dentist would have undoubtedly resulted in a complete cure.

Watson-Williams⁷ records the case where a peg, which got lost in the antrum, passed into the nose through the ostium maxillare without operative interference.

Combe⁸ (Paris) has described a case in which a drainage-tube, which had been put in a dental alveolus, had become lost. In spite of enlargement of the alveolus, no foreign body could be found in the antrum. Four years after, the tube, measuring 2 cm., was spontaneously evacuated through the nasal passages. It was covered with sticky, black matter and calcareous incrustations.

McReynolds⁹ reports the remarkable case of an iron bolt (referred to in Newcomb's list), measuring $\frac{3}{8}$ in. in thickness and 1 $\frac{1}{2}$ in. in length, which gained access to the maxillary antrum, unknown to the patient, through an accident, and remained there for four years without causing any symptoms beyond slight and temporary neuralgia. It was finally drawn through the necrosed socket of a molar tooth by the patient.

Whilst in the majority of cases symptoms have occurred soon after the entry of the foreign body into the antrum, yet in a few cases no symptoms whatever have occurred. Sterile and non-irritating bodies may remain a long time in the antrum without causing symptoms.

¹ *Rev. Internat. de Laryngol.*, 1910, xxxi, No. 1, p. 356.

² Newcomb: *loc. cit.*, p. 109.

³ *Zeitschrift für Laryngologie*, 1914, vi, p. 821; Abstract, *JOURN. OF LARYNGOL., RHINOL., AND OTOL.*, 1915, xxx, p. 197.

⁴ *Brit. Med. Journ.*, 1890, i, p. 135.

⁵ "Proc. Roy. Soc. Med." (Laryngological Section), 1911, iv, p. 98; also *JOURN. OF LARYNGOL., RHINOL., AND OTOL.*, 1911, xxvi, p. 213.

Quoted by Freundlich: *Laryngoscope*, 1915, xxv, p. 42.

JOURN. OF LARYNGOL., RHINOL., AND OTOL., 1899, xiv, p. 73.

⁸ "Annales des Maladies de l'Oreille, du Larynx, du Nez et du Pharynx." Paris, June, 1894.

⁹ *Laryngoscope*, 1908, xviii, p. 215.

Small bodies may be felt by the patient to move about in the antrum. Suppuration caused by foreign bodies in the maxillary antrum would appear to be uncommon, judging from the report of Wenner,¹ who found that in 68 out of 3409 cases, or 2 per cent. of antral suppuration foreign bodies were present, but in many were not the cause of the disease. In 30 cases—less than 1 per cent.—the foreign bodies were the cause of antral disease. In 14 cases teeth were found.

In the case reported by us, Mr. Millican considers that the only reasonable explanation of the way by which the aluminium rod made its entry into the antrum is as follows:

Having removed the right upper molar, the operator possibly discovered an opening into the antrum from the socket. For some reason unknown, he then must have tried to make a plug for this opening from a piece of aluminium rod—possibly intending to fix this afterwards to a vulcanite plate. From the pliers-mark (shown in Fig. 3) it would seem that he obtained the right length by cutting the rod *in the mouth*. This would cause it to be projected with some violence into the antrum—an exceedingly dangerous practice.

When questioned afterwards by the patient's friends, the operator would not admit any accident or inadvertence on his part.

REMARKS BY MR. CHARLES A. CLARKE, L.D.S.

When I saw this patient for Mr. Millican I took stereoscopic radiographs of the right side of the face, endeavouring to obtain a view of the right antrum unobstructed by any bony tissue. Also I took a radiograph in the posterior-anterior position. These, when viewed in the stereoscope, showed a foreign body situated vertically against the anterior wall of the antrum, which was the exact seat of the pain.

Personally, I considered it was not metal, owing to the amount of penetration shown, due to its low density, considering of course what foreign body it most probably would be: it was not a hypodermic needle, being of too low a density for any metal of which needles are made, and also, when allowing for the magnification due to its distance from the plate, much too large in diameter. I was of opinion that in all probability it was a piece of rubber drainage-tube of unusually small diameter. Rubber varies very much in its density, according to the purpose for which it is intended, and considering the matter practically I thought this was the most likely material.

The interpretation of a radiograph—and I always prefer to interpret from the negative rather than from prints—is the discrimination between light and dark shadows which are due to penetration or impenetration. These, again, are dependent upon the density or specific gravity of the tissue or material examined. The shadow of the foreign body showed penetration, *i. e.* low specific gravity. I was, therefore, not surprised to find that the material was aluminium, which has a specific gravity of 2.76, while steel as used for hypodermic needles is 7.7 to 7.9.

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SOCIETIES' PROCEEDINGS.

THE AMERICAN LARYNGOLOGICAL, RHINOLOGICAL, AND OTOLOGICAL SOCIETY.

Meeting at Chicago, June 15 and 16, 1915.

(Continued from p. 330.)

Experimental Studies of the Effect of Various Atmospheric Conditions on the Upper Respiratory Tract.—Gerhard H. Cocks. —The purpose of the experiments upon which this contribution is based was to add to the knowledge concerning the exact place of atmospheric changes of temperature in the production of respiratory disease. In order to accomplish this direct observations were made upon the respiratory tract under conditions which could be absolutely controlled as to temperature, humidity, and air movement.

The observations were conducted under the auspices of the New York State Commission on Ventilation, who provided for the purpose two adjoining rooms, approximately ten by fourteen feet each. These rooms

were so arranged that any degrees of temperature and humidity could be secured and recorded. Room A, the control room, was fitted with white-tiled walls, and with machinery for controlling atmospheric conditions in both rooms, viz., fans, air washer, heating stacks, steam lines, and ducts. Room B, the observation room, was also fitted with white tiled walls, covered with cork board and cement. The two rooms were adjacent with a window in the common wall. Metallic mirror records were made of the results of the clinical examinations of the nasal passages in practically all experiments except those made in the hot, moist room (86° F., 80 per cent. relative humidity).

The experiments were made on the following divisions: (1) Series A: Examination of 131 cases changing from one atmospheric condition to another. (2) Series F, studies in air movement: Examination of 77 cases changing from one atmospheric condition to another, with fans blowing directly on the face. (3) Series B, skin reflexes: Examination of 57 cases with body in one room and head in another room having a different temperature. (4) Series C, skin reflexes: Examination of 42 cases with the body exposed to one temperature, and the feet immersed in a water-bath of a markedly different temperature. (5) Series G, studies in workers exposed to dry heat: Examination of 45 cases of workers in dry heat (firemen, stationary engineers, boiler workers, etc.), on going from one temperature to another. (6) Series G, studies of outdoor workers: Examination of 58 cases of out-door workers (truckmen, drivers, etc.), on going from one temperature to another. (7) Series G, studies of cases of atrophic rhinitis corresponding to workers in moist heat: Thirty-nine observations on cases of atrophic rhinitis on going from a hot dry room to a cold room, and *vice versa*. It was found that a large proportion of workers in hot, moist rooms (steam laundries) suffer from atrophic rhinitis. Owing to the difficulty of securing employees of laundries who could be induced to give the time required for the experiments, other cases of atrophic rhinitis were substituted for laundry workers. (8) Series G: Examination of 46 laundry workers (while on duty in two steam laundries in New York City). (9) Experimental observations on the larynx and trachea of dogs subjected to peripheral stimulation by means of heat and cold.

Summary and Conclusions.—Clinical experiments demonstrated that distinct changes in the mucous membranes of the nose result from changes of air temperature and humidity. In the majority of instances the reaction is one of increased swelling, moisture and redness from heat and the reverse from cold. The effect of air blown directly upon the face by fans greatly modifies the changes observed. On going from the cold to the hot room with fans, there is a decrease in the size of the inferior turbinate, and in the amount of moisture. The characteristic change on passing from the hot to the cold condition with fans, is an increase in the turbinates and secretion. It was further observed that moist heat produces greater changes than dry heat, while the highest percentage of cases of atrophic rhinitis was found among long-time workers in hot, moist rooms (steam laundries).

The window and foot-bath experiments tend to show that the reaction of the nasal structures to atmospheric changes is primarily direct and local and not reflex, although evidence on this point is inconclusive. It must be remembered that turbinate reactions are very delicate, and that the changes observed were by no means constant. It would appear, however, that the reactions in the nasal mucous membranes produced by changes in atmospheric environment are too frequent and too definite to

be disregarded. Consequently, he was convinced that the theory that bacterial infection as the sole cause of catarrhal inflammations of the upper air passages is not tenable, since the changes produced by environment must materially affect the incidence of infection.

Dr. WOLFF FREUDENTHAL considered the effect of atmospheric conditions on the nose and throat a very important question, one in which he had been interested for more than twenty years, and upon which he had written a great deal. When he first came to this country he noticed that he could not breathe as well as in Germany, and that when he went into hot apartment houses he could hardly breathe at all. He began then to investigate the amount of humidity and the temperature in these houses. The normal amount of the relative humidity should be 50 per cent., though one could live comfortably in an atmosphere of 40 per cent. But in winter it went below 20 per cent. He could not agree with the essayist as to the influence of the moisture in the atmosphere. The experiments were highly interesting, but not conclusive. In New York and the New England states it was not the moisture of the surrounding waters the effects of which one felt. The majority of people spend daily twenty-three hours at least in very hot and very dry rooms and not at the sea shore. He believed that dry atmospheres were conducive to dry rhinitis, and that those who live in moist atmospheres do not have this. He was surprised at Dr. Cocks' statement with reference to laundry workers having dry rhinitis. The steam, as Dr. Cocks had said, came directly up from the mangles. If applied to the hands it would burn them, and the same applied to the mucous membrane, would cause destruction of the same. The effect was not one of moisture, but of burning. It was surprising to see how well some people could breathe with swollen mucous membranes, whereas others would complain of being unable to do so with dry and wide nasal chambers. The latter class could not assimilate the air well. Experiments along this line had been made at the University of Kiel, and Freudenthal's views corroborated in every point. At New Bedford Station, forty miles outside of New York, experiments had been made with reference to tuberculosis, and it was surprising to see how much effect dryness of atmosphere had on these patients.

Dr. ARTHUR I. WEIL (New Orleans, La.), said this paper explained the statement, made in conversation, of one of the members of the Society from Denver, to the effect that he practically never saw a case of atrophic rhinitis in that city. In New Orleans, on the contrary, the speaker saw more of this condition than of any other. Dr. Cocks' investigations showed why this should be the case. He could bear out Dr. Freudenthal's contention with reference to these patients with atrophic rhinitis complaining of lack of air. He had formerly thought that when patients complained of inability to breathe through the nose he would find hypertrophic rhinitis: now, however, he was equally prepared to find atrophic rhinitis.

Dr. GEORGE F. COTT (Buffalo, N. Y.), called attention to a forthcoming article in the *Annals of Otology* which would bear upon the subject under discussion. Dr. Cocks did not state whether the air used in the experiments was pure or contaminated. The air one ordinarily breathed was contaminated. In experiments with the air from schools in Brooklyn there had been collected five pails of dust in five days from the air the children breathed. This was a powerful factor in determining the results.

Dr. THOMAS J. GALLAHER (Denver), believed that among the

rhinologists of Denver it was the consensus of opinion that cases of atrophic rhinitis developing there were seldom encountered. The vast majority of cases seen there were in people who had lived in a low, moist climate, and in whom atrophic rhinitis had already developed before coming to Colorado. Subjects of atrophic rhinitis were more uncomfortable in Denver owing to the diminution of the humidity of the air. The turbinate bodies must throw out more fluid, and, their inability to do so, resulted in an increase of crust formation. However, he had seen many cases of vasomotor rhinitis develop in the high and dry climate. The cause of this was not yet known and the disease was peculiarly rebellious. It was certainly not due to the flora in different altitudes as it occurred throughout the year without any amelioration, the patient remaining in the same place. He had seen remarkable results from sending the patients to the sea shore. The effect was very complex, but the good results probably came through the local influence of the air upon the nasal membrane plus the general effect upon the blood vessels and nervous system.

Dr. ROBERT LEVY (Denver, Col.), did not believe atrophic rhinitis occurred rarely in Denver. It was mainly a disease originating in childhood. The cause was still in doubt. As a matter of fact, children with atrophic rhinitis were found in Denver, but, in his experience, the condition was not confined to children. It was more common in children than hypertrophic rhinitis. His clinical assistant, Dr. Cooper, was making a study of cases of atrophic rhinitis in children and adults, and he had enough cases to make a presentable showing. He had seen enough cases in the clinic alone, aside from those in private practice, to warrant his going on with the study. It was not, however, as frequently found in Denver as elsewhere.

Dr. COCKS in closing, answered Dr. Cott's question in regard to dust by stating that, in his opinion, the results of the tests made in the experimental chambers were not influenced by contamination with a dusty atmosphere. The physical conditions in experimental chambers were practically ideal. Nobody was allowed in the rooms except the observers and the subjects of the experiments.

(To be continued.)

Abstracts.

EAR.

Orientation and Equilibration.—A. B. DUEL. New York Academy of Medicine: Meeting of December 16, 1916.

The opening paper reviewed our physiological knowledge of the subject, and his most interesting remark is that such deaf-mutes as are born without a vestibule are incapable of feeling sea-sickness.

In the discussion which followed, H. PIKE pointed out that in studying morbid affections of the cerebrum, cerebellum, and vestibule, experimental data are more reliable than clinical. For the latter are befogged by coincident causes. Thus in cerebral or cerebellar abscess it is difficult to exclude the effect of toxins; and in tumours, of raised intracranial pressure. As we ascend the scale of species, the anterior, cerebral end of the neural axis becomes relatively more important, and the cerebrum in the higher mammalian forms attains an increasing control of orientation.

M. Withney pointed out that in deaf-mutes with both labyrinths destroyed, compensation by other senses is incomplete; thus, the patient cannot keep his direction when swimming. Hæmorrhage into the labyrinth is followed by a definite triad of tinnitus, deafness, and vertigo *in a definite direction*. Hysterical vertigo has no definite direction.

H. Lawson Whale.

Sonorous Vibrations in the Treatment of Diseases of the Ear. Lester-Head Hubly (New York). "Journ. Amer. Med. Assoc.," December 19, 1914.

The author quotes at length various figures to show the utility of sonorous vibrations in treating catarrhal and suppurative otitis media and otosclerosis.

For low notes the improvement in hearing obtained is feeble; indeed, the perception of these may even diminish with the treatment.

Besides the improvement attained in hearing, tinnitus, paræsthesia acoustica, otalgia, and sensations of fulness in the ears may be relieved. This treatment is contra-indicated in acute suppurative otitis media, any form of internal otitis, extreme nervous exhaustion, and absolute middle-ear deafness.

H. Lawson Whale.

NOSE.

Intranasal Operation on the Frontal Sinus.—O. T. Freer. "Laryngoscope," December, 1915, p. 803.

Freer points out that in the dry frontal bone the openings of the frontal sinuses are quite large enough for drainage. The ethmoidal cells, however narrow the outlet, while the ostium lies at a lower level than that of the opening in the frontal bone itself at the bottom of a funnel formed by the walls of the anterior ethmoidal cells and the internal angular process of the frontal bone. Exceptionally an anterior ethmoidal cell lies between the ostium and the nasal crest. Externally and posteriorly an ethmoidal cell (or cells) lie between the ostium and the orbit. The uppermost of the ethmoidal cells are incomplete in the ethmoid bone and are only completed when roofed in by the innermost portion of the orbital plate of the frontal which borders the incisura ethmoidalis. Internally the ostium is bounded by the expanded plate of the anterior superior nasal spine of the frontal. At the posterior part of the inner wall of the "ostium funnel" is situated the thin orbital process of the frontal, which forms the anterior boundary of the olfactory fossa. The orbital plate may project into the frontal sinus—the crista olfactoria of Boenninghaus. This region is dangerous and therefore no cutting should be done in an inward direction. Freer holds that it is not safe to cut forward as is usually advocated because the hard bone of the nasal crest requires strong instruments, the forcible manipulation of which may endanger the overhanging posterior sinus wall. Usually the space obtained by cutting forward is not of itself enough for drainage and may be lost by the formation of granulations. However, a great increase in the size of the ostium can be obtained by working backwards and removing the "foveal cells." Powerful instruments are not required, but merely light curettes. In this way the anterior ethmoidal cells, which form the obstacle to drainage, can be removed. Further, the enlargement is made in a more capacious part of the nasal cavity while the mucous

membrane of the opened ethmoidal cells serve to line the new channel and thus prevents contraction.

The orbital plate of the frontal bone as seen in the floor of the anterior cranial fossa, rises gently from the edge of the cribriform plate in its posterior part, but more and more steeply in front. The orbital plate then bends over in a horizontal direction to cover the "foveal cells" for a distance of about three-eighths of an inch. A backward extension of the frontal sinus (Recessus para-cribrosus) may displace the foremost foveal cells. In many cases the foveolæ of the foremost cells become cavities penetrating the orbital plate in the form of fronto-ethmoidal cells. The foremost may be much larger than the frontal sinus, so that it looks like a second frontal sinus. The outer wall of the operative field is the lacrymal bone in front and the "paper plate" of the ethmoid behind.

This wall is frail and liable to perforation. Freer knows of two cases in which blindness followed such perforation. Internally the operative field is bounded by the turbinal wall which is continuous above with the lateral wall of the olfactory fossa in the cranial cavity, so that a fissure created here might lead to meningitis. Below, the terminal wall terminates in the middle turbinate.

The surgical passage of approach to the frontal sinus lies between the parallel walls mentioned above—orbital and turbinal. Antero-posteriorly the surgical passage extends from the ascending frontal process of the superior maxilla in front to the lamella of the middle turbinate behind. This lamella separates the operative field from the posterior ethmoidal cells. At its narrowest part the passage is from one-fourth to one-half inch wide.

Steps of Freer's Operation.—A previous resection of the anterior part of the middle turbinate is usually necessary. A probe is introduced as a guide into the sinus after clearing away obstructing ethmoidal cells if this be necessary. The probe may pass into an infundibular ostium or the ostium may lie in front of the infundibulum. (Freer holds that the frontal sinus probe should thicken evenly like a trout-rod from its distal end towards the butt. Such probes are best made of copper.) The next step of the operation is the removal of the anterior ethmoidal cells up the sinus floor. Freer begins this part by breaking into the ethmoidal bulla which is a constant structure. Before entering the bulla, however, it may be necessary to resect a prominent uncinate process by means of Freer's septum knives. The bulla is entered with the cutting edge of the curette turned forwards because this permits of vigorous work, as it aims at the strong bone of the ascending process of the superior maxilla. This procedure at once admits the probe into the sinus, even if it would not pass before. Remnants of the anterior ethmoidal cells are cut away with punch forceps. In most cases the removal of these cells breaks away the posterior part of the frontal sinus floor and so at once establishes a good opening. Sometimes, however, the sinus floor is resistant all round the ostium, and for such cases Freer has devised a probe curette which is passed into the frontal sinus and cuts its way downwards and backwards to make room for a larger but similar curette. Freer also used a curette which cuts downwards and forwards to remove a cell which may lie between the ostium and the internal nasal crest. He admits, however, that the dental burr may be indispensable in some cases.

Freer does not approve of curetting away the mucous lining of the frontal sinus, because, if in spite of intranasal drainage the suppuration and headache continue, external operation is required. In most cases the

new channel into the sinus is so large that it remains permanently open, but occasionally the introduction of a drainage-tube is necessary. In such cases Freer uses a self-retaining rubber tube with two rubber flanges. This tube is stretched over the introducer, lubricated, and passed into the sinus. The tube is then cut off in the nose. As a rule, no after-treatment is needed, but the sinus may be washed out through the tube, necessary. Freer does not believe in the passage of bougies to prevent adhesions.

J. S. Fraser.

MISCELLANEOUS.

The Treatment of Hay-fever, with Pollen Solutions and Calcium Chloride.—Wilson. "The Laryngoscope," June, 1916.

The author states that the symptoms of hay-fever are: *A. characteristic*: (1) Itching, redness, and swelling of the skin or mucous membranes of the body, throat, nose, eyes, etc. (2) Sneezing, lachrymation, rhinorrhea. (3) Asthma. *B. miscellaneous*: (1) Fever, malaise, asthenia. (2) Vomiting, diarrhœa, cardiac disturbances, swelling of lymph nodes.

There are more than fifty plants to the pollen of which hay-fever subjects are sensitive. To this we may add many fruits, such as strawberries, raspberries, pears, bananas, etc.; vegetables, such as tomatoes, celery, spinach; shell-fish, e.g. lobsters, crabs, and oysters; eggs, milk, various meats, etc. All these substances contain special protein bodies, which are the active agents in causing the symptoms in question. This same symptom-complex may be caused by substances which contain no protein whatever, such as quinine, iodine, ipecac, and salol. The vaso-motor mechanism concerned in the production of the sensitisation-syndrome may be set in operation in more than one manner. Physiological (pathological?) chemistry is at the bottom of the whole series of phenomena. Sensitisation appears to be closely related to what we know as anaphylaxis, and to alterations in the relations of the endocrine glands.

Treatment by Pollen Vaccine.—Having ground a weighed portion of the dried pollen in an agate mortar with a small amount of water or saline solution, more salt solution is added, and the whole incubated for twenty-four hours. The mixture is centrifugalised, and the clear supernatant fluid used as a basis for subsequent dilutions. The term "pollen-unit" means the soluble protein contained in 0.000,001 gram. of dried pollen. As regards dosage, it is quite safe to begin with one or two units. In many cases considerably more than 1000 units may be safely given after a sufficiently extended preliminary desensitisation. Injections should be given at intervals of three to five days.

Results obtained with Pollen Vaccine.—Wilson states that of eleven patients treated in 1914 with pollen solutions, none were absolutely relieved, and only two could be said to have shown "marked improvement." Of ten patients treated with pollen solutions in 1915, one (in her second year of treatment) had absolute relief, and one marked improvement. These results are not as brilliant as those reported by other writers, probably because Wilson is unable to accept anything short of marked relief from hay-fever symptoms as definitely due to treatment, and even this degree of improvement, if it is more or less transitory, may arise from other causes. Multiple sensitisation is a frequent phenomenon in hay-fever subjects, and its existence may

account for many failures in the treatment by means of pollen solutions.

The Treatment of Hay-fever by Calcium Chloride.—*Dosage*: Calcium chloride crystals, 100. Distilled water, enough to make 500. S.: Take one teaspoonful in sufficient water, with or after each meal. *Mode of action*: The salts of calcium are said to increase bodily energy and resistance; relieve insomnia; relieve tendency to nasal catarrh, bronchitis, etc.; inhibit auto-intoxication. Lime salts have an important part in the activation of certain body ferments, such as rennin, thrombin, and trypsinogen. Calcium salts lower the irritability of nervous tissue, especially of the vasomotor system.

The results of the treatment with calcium chloride have been more satisfactory than those of treatment with pollen solutions. There seems to be no definite contra-indications to the daily ingestion of 3.0 to 6.0 grms. of calcium chloride. Anyone taking one or two pints of milk daily, will get as much calcium.

J. S. Fraser.

REVIEWS.

Medical Annual. A Year Book of Treatment and Practitioners' Index. 1917 (thirty-fifth year). Bristol: Wright & Sons, Ltd.

The "Medical Annual" is as bardy as ever and is again full of good things. It need hardly be repeated that the sections on diseases of the throat, nose, and ear get more interesting and instructive all the time in the hands of Mr. J. Fraser of Edinburgh. We can see no sign so far of the "staleness" which is apt to develop in the compiler or abstractor who has worked so long. In fact the articles seem to reach a higher standard each year. The specialist will find the ground thoroughly explored, and he will be exceptionally well up in the special work of the past year if he does not meet with references which he has overlooked.

Among the many outstanding attractions of the Annual for the specialist are the references to conditions outside our specialty which produce symptoms usually associated (by us) with diseases of our "special" organs, or which have an important bearing on the course, treatment, and prognosis of these diseases. In a word the "breadth of view" for which we ought to strive is distinctly fostered by the study of the "Medical Annual." Many illustrations of these views will "jump to the eyes" of him who goes through the admirable index of the present volume and consults the text at the appropriate passages. If he is a junior he will find much suggestive guidance, and if a senior, much to explain many of his unexplained experiences.

Dundas Grant.

Index of Differential Diagnosis of Main Symptoms. By various writers. Edited by HERBERT FRENCH, M.A., M.D., F.R.C.P. Second edition. Pp. 912. With 37 coloured plates and over 300 illustrations in the text. Bristol: John Wright & Sons, Ltd. London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd. Toronto: The Macmillan Company of Canada, Ltd. New York: Wm. Wood & Co. 1917.

It was in 1912 that the first edition of this *magnum opus* made its appearance, and it is with great pleasure that we commend to our readers the second one. There have been several reprints of the former, but in

this one the work has been revised and in some respects enlarged. The volume is rather more bulky, but this is mainly due to the greater size of the pages, which allows of a larger and consequently clearer type, an advantage which the presbyopic reader will find most acceptable. Actually the total number of pages is rather diminished, but the new pages hold more than the old, so that, for example, we find the article on Amnesia, on p. 25, in the old edition, and p. 19 in the new. *En passant* the writer observed in this article the description of Korsakow's syndrome with which as such he was quite unacquainted. It is stated to be "generally the result of alcoholism" and "is characterised by hypomnesia, disorientation, and pseudo-remiscences. The patient loses memory for recent events, has no appreciation of time or place, talks freely and often plausibly about events which have never occurred, and yet may retain a very natural attitude of mind towards his surroundings." Perhaps Korsakow's syndrome in its milder forms is not very rare if we may judge by cases we have observed of "hypomnesia" (for failures), "disorientation" (of the logical faculties), and "pseudo-remiscences" (of brilliant successes). It is most interesting and instructive to note the point of view of the physician as compared with that of the oto-rhino-laryngologist in regard to conditions which may reasonably be looked upon as common ground. Thus, in the article on discharges from the nose (p. 178), measles is said to offer the greatest diagnostic difficulty, and to assist in overcoming it a most beautiful full-sized coloured plate presenting Koplik's spots is added in this edition. The mode of attacking the diagnosis of the different forms of noses in the ears is equally striking. We can only again recommend our *confrères* to possess themselves of this helpful work.

Dundas Grant.

NOTES AND QUERIES.

At the Annual Meeting of the Royal College of Surgeons of Edinburgh, Dr. Robt. MacKenzie Johnston, Consulting Surgeon, Ear and Throat Department of the Edinburgh Royal Infirmary, Examiner to the Royal College of Surgeons, was elected President of the College for the year ensuing.

AN AURICULAR DEFECT.

A doctor at the Pensions Tribunal asked an applicant if he was deaf.

"Oh, no!" said applicant.

Judge Parry: "You must never say 'deaf' to anyone. Are you hard of hearing?"

Applicant: "Oh, yes."

The Doctor: "They probably noticed the auricular defect."

Judge Parry: "'Auricular defect' is decidedly good."

WASTED CHARM.

"Go and talk to him nicely," advised the Acton magistrate recently, when a woman brought to him a complaint about her husband.

"Talk to him nicely? He's as deaf as a post!" replied the wife.

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